The Excavating Engineer

PUBLISHED MONTHLY

Ten Cents Per Copy — One Dollar Per Year

Vol. 13 — MILWAUKEE, MARCH 1917 — No. 6

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One of The Upper Hudson Stone Company's 103-C Bucyrus Steam Shovels, getting her nose into some heavy stuff.

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THE EXCAVATING ENGINEER PUBLISHING COMPANY

BRADLEE VAN BRUNT, Manager and Editor

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VOL. XII,—OCTOBER, 1915—NOVEMBER, 1916

Articles are arranged under the following classifications:

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Mining and Stripping.
Cement, Rock, Clay and Gravel Plants.
Road and Street Construction.
Sewer and Ditch Construction.
Basement and Miscellaneous Excavation.
Irrigation, Drainage and Miscellaneous Canal Excavation.
Dredge Work.
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Field Notes.
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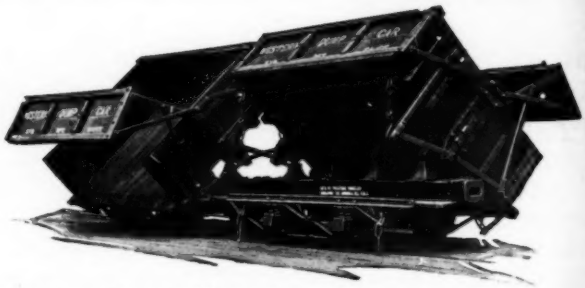

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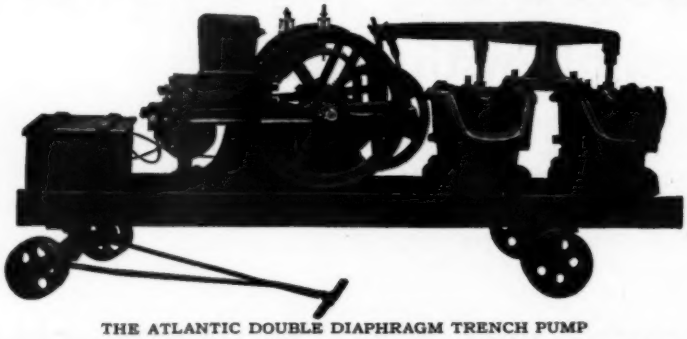

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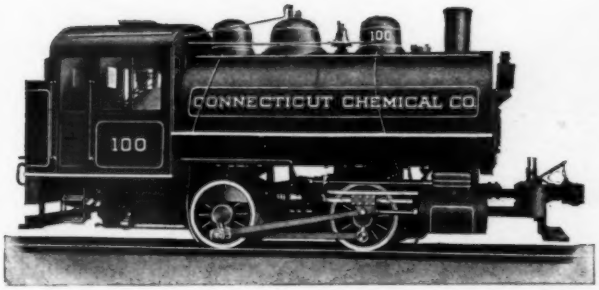

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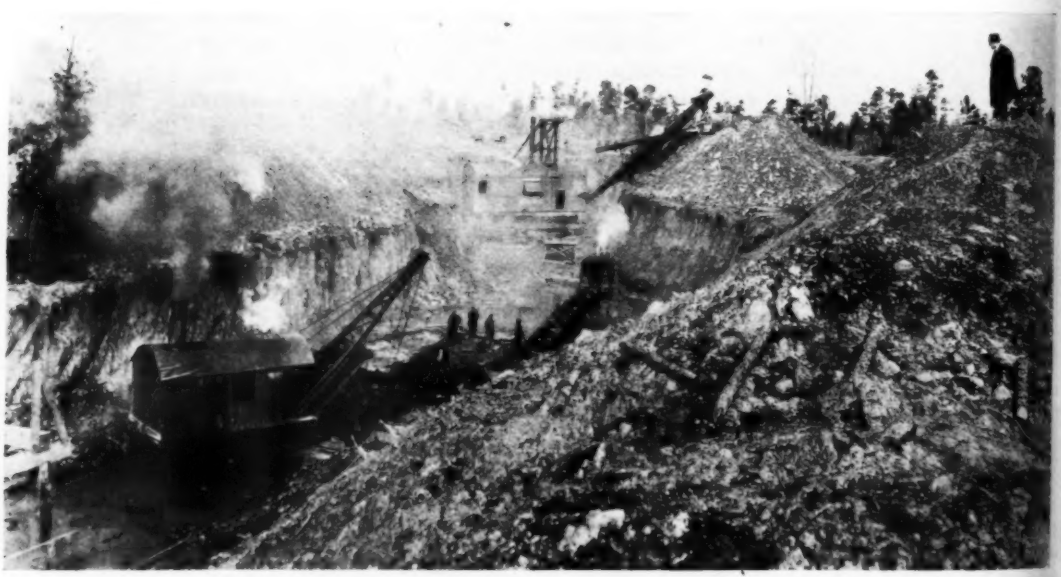
150-B Bucyrus shovel working its way through a deep box cut. Observe platform behind the shovel to facilitate coaling.



Mining the coal behind the 150-B. This view shows the crookedness of the box cut.

The Excavating Engineer

Vol. 13 MARCH 1917 No. 6

Stripping a Coal Deposit Near Carbon Hill, Alabama

Where former shaft-mining proved uneconomical the Brookside-Pratt Mining Company have adopted the open-cut method of operation with success. Performance of a revolving shovel of the coal stripping type in overburden averaging 20 ft. in depth.

BEFORE the Brookside-Pratt Mining Co. obtained the option on the coal property which they are now working near Carbon Hill, Alabama, this property had been mined by the underground method. A comparatively shallow over-burden and the lack of sufficient rock strata to serve as a roof had made it extremely difficult to timber. Moreover there proved to be a loss of at least 30 per cent of the coal on account of the caving in of the roof and because of the necessity of maintaining pillars of coal for supporting this roof. In consequence the undertaking had been uneconomical and operations were discontinued. The Brookside-Pratt Mining Co. at this time obtained an option on the property and studied the proposition from all angles. They finally determined to purchase the property and work it by the open-cut method thereby eliminating the difficulties above mentioned.

For the past six months the shovel has been operating on a portion of the property which had had not been previously mined underground. After surrounding this piece of land with a box cut, they are now making additional cuts in the usual manner previously described and are depositing the overburden where the coal has been removed.

For the greater part of the year the shovel has been working one shift of eleven hours, but during the rush periods when the coal market is active it is double shifted. For this purpose the shovel is equipped with electric lights purchased from the specialty department of the Bucyrus Co. which according to Mr. T. M. Porterfield, secretary of the company are giving excellent satisfaction. For the last six months they have been running day and night as they have been pushed hard in order to keep ahead of the great demand for coal which has developed.

The contract for the stripping was awarded to the C. G. Kershaw Contracting Company well known contractors of Birmingham. This contract calls for the removal of somewhat over 2,000,000 cubic yards of material.

The Stripping Problem

The coal deposit lies under overburden which has an average depth of twenty feet, although several places have been encountered where this ran up as high as 29 feet. The material consists of about 3 feet of soapstone lying immediately on the top of the coal and the balance rotten shale and clay. Except for the soapstone the digging is quite easy.

The shovel chosen for the job is a 150-B Bucyrus equipped with a 60-foot boom and a 2½-yard dipper with a dipper handle 38 feet in length. Its weight in working condition is approximately 158 tons. This shovel is the smallest of the revolving type used for coal stripping built by the Bucyrus Company. It was selected, however, as it appeared from the prospector's estimate that it could handle the extreme depth of overburden with no difficulty.

The problem encountered was an interesting one. In planning the method of making the cuts it was necessary to take account of the fact that portions of the property had previously been mined underground and were consequently honey-combed with shafts and passages. As a result no regular plan of cuts could be followed. The usual method of operation is a series of regular cuts running across the property. Under such conditions it is possible after the first or "box" cut has been completed, to make a second cut alongside this and deposit the excavated material in this cut after the coal has been taken out. However, for the reason above explained this method could not be followed on those portions of the property previously worked underground.

The shovel started in at the outcrop on December 10th, 1915, about 500 feet from a country road known as the Jasper Road. For about six months it took a long zig-zag cut or series of cuts with a bottom

width of 50 feet and an aggregate length of over a mile. Running this cut in this irregular manner over the property, necessitated, of course, all box-cut work which, as the shovel had to deposit the material on the original ground surface, made it impossible for it to handle 29 feet without a little rehandling. In two places cuts were encountered to this depth, one 200 feet and the other 300 feet in length. This had not been anticipated by the prospectors. These cuts were handled by the shovel by the simple expedient of raising the boom and with the assistance in one instance of some teams which took away some of the extra material and allowed more room for dumping.

Four men are used on the shovel and from four to five in the pit. This is all the labor required around the big shovel. The 150-B has been making a good steady average. During the month of March it turned out 49,000 cubic yards working single shifts.

Mining the Coal

The coal vein varies in depth from 40 inches to 60 inches. The drilling and blasting of this coal is all done at night, Chicago Pneumatic Tool Company's drills being used. A sufficient amount of coal is obtained in this way to keep a No. 1 Thew revolving shovel busy for the following day. This shovel operates back of the big machine and loads the coal into 2-ton tram cars built by the Kershaw Company. Two trains of twelve to fifteen cars each are used and are hauled by 14-ton Porter locomotives. The longest haul that these trains will have to make to the tipple will be one mile. It averages, however, from 1500 feet up depending on the zig-zagging of the cuts.

Two men are employed on the small shovel and four in the pit. They load about 350 tons of coal per day of 11 hours.

The tipple is located on the Frisco and on the Illinois Central Railroads. The coal is here washed and graded. It is sold by the Bonnyman-Norman Coal Company who have offices in the Brown-Marx Bldg. at Birmingham. Mr. James Bonnyman is president of the Brookside-Pratt Mining Company, A. R. Long is general manager, and H. P. Culligan, superintendent. Much of the credit for the efficient planning and execution of this work is due to the president and secretary of the C. G. Kershaw Contracting Company, namely, C. G. Kershaw and T. M. Porterfield. The shovel is operated by Sam Alread and craned by Harry Michel.

Immediately after the erection of the 150-B was completed. The shovel starting to dig its way down to the coal.

Methods of Transporting Small Dragline Excavator to Different Parts of a Big Job

How the Winnipeg Aqueduct Construction Co., Ltd., transported their class-7 Bucyrus dragline to different parts of their contract.

Along the 47-mile line of the contract of the Winnipeg Aqueduct Construction Co., Ltd., it is frequently necessary to move their small draglines to different portions of the big job. As we have described in our issues of November, 1915, and January, 1917, this aqueduct is paralleled with a construction track for the whole distance. The methods adopted for moving these draglines, which are mounted on skids, are interesting. They might offer suggestions to contractors who are confronted with the same problem.

Fig. 1. Dragline mounted on flat car, being moved from one camp to another.

The class-7 Bucyrus dragline of which the Winnipeg Aqueduct Construction Co. have seven in operation, weighs approximately thirty tons in working condition.

Wm. Smaill, general superintendent of the Construction Co. tells us that when they only move short distances and these moves can be made between trains the following method is used. The dragline is mounted on a low truck, made of two 10 x 18-inch bridge timbers set on a couple of heavy axles with low flanged wheels. These axles run loose in channel irons in such a way that it is possible to make curves easily. The channel irons are bolted to the timbers

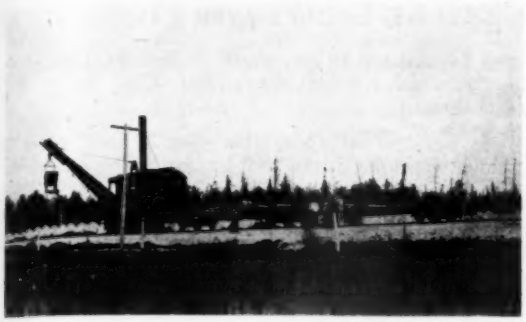


Fig. 2. Dragline mounted on a low truck, pulling itself along. This method is used for short distances where the move may be made between trains.

and the wheels run loose on the axles. The dragline pulls itself along, the rollers, pads, etc. being loaded on push cars, behind. Figure 2 illustrates this method.

When the machines have to be moved from camp to camp, it is necessary to use flat cars which could be taken in any of the trains. The method of mounting the machine on this flat car varies with the condition of the ground and the track. The usual way is to run the machine on to the track on the skids and rollers, where it would be jacked up and slid on to the flat car. Where the railway fill was not very high above the surface of the surrounding ground, a slight incline would be built of logs and of whatever timber was available. The dragline would then place its pads on these timbers and pull itself up on to the flat-car. One way of doing this was to attach the dragline cable to a tree to pull itself up in this manner. Another method was to hook the bucket on to the side of the car, using a piece of timber to protect the car from injury. This method is shown in figure 3. This photograph also shows a number of men riding on the end of a piece of timber, the other end of which is set between the hog-rods and the bottom of the car in order to prevent the car from overturning.

The simplest and most economical method, however, where the car is not too high above the ground level is to let the machine dig and build for itself a slight incline to the top of the car, up which incline it would climb in the usual manner.

When the machine is safely on the car, the skids are removed and the machine lowered until it rests on the sub-base. This is necessary, as were the skids allowed to remain in place, they would project out too far and would interfere with passing road

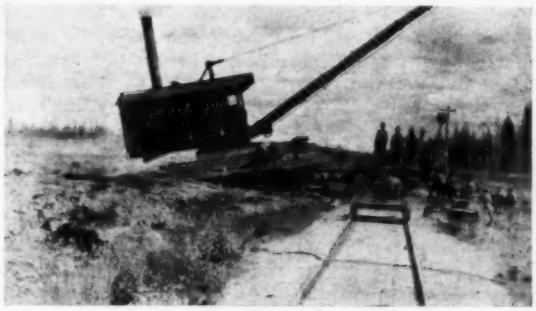


Fig. 3. Dragline pulling itself up on a flat car.

crossing fences, railway signs, etc. The pads, rollers and planks are loaded on the car with the machine. When everything is on, the dragline is blocked or its boom tied to the sides of the car to keep the machine from swinging when going around curves. The unloading is always done by first setting pads in position and then cribbing up in the usual manner. After this is done, the dragline is slid off the car and on to the crib by means of her rollers. It is then lowered down with jacks. Two days are generally lost in making such a move as they can only get the track for a short time during the day in order to load, and the same next day when unloading.

We are indebted to Mr. Wm. Smaill for the photographs and for the above description.

Abandoned Railroads Purchased

The Idaho Southern Railroad which runs from Gooding to Jerome, Idaho and the Milner & North Side Railroad, a short line extending from Milner to Oakley, Idaho, comprising a total of approximately 50 miles, have been purchased by the Walter A. Zelnicker Supply Co., of St. Louis, Mo.

These railroads were built only a few years ago by Pittsburg capital. It is understood the Walter A. Zelnicker Supply Co., will dismantle the roads and sell the rails and other equipment, which are practically new.

The Eye of the Law

First Officer—Did you get that fellow's number?
Second Officer—No; he was going too fast.
First Officer—Say, that was a fine looking dame in the car.
Second Officer—Wasn't she!

SHE: "Can't you give me something for my throat, Doctor? I'm a little hoarse."
HE: "Madame, I'm not a Veterinary."—*Harvard Lampoon.*

Railroad Terms

An old railroad man sat with a friend on a hotel piazza as a string of chappies went by in their flashy togs.
"Passengers or freight?" smiled the friend.
"Empties," said the old man.—*Ex.*

Steam Shovel Operation on the East St. Louis Levee Project

Extensive operations underway on the east bank of the Mississippi River, south of East St. Louis. A description of John Keeley's contract on which a steam shovel and dump cars are being used.

FETTERING a stream which is subject to so many and so various moods as is the periodically wrathful Mississippi, has brought out a great variety of methods of operation and has developed many interesting types of especially designed machinery.

This last condition is found for the most part along the southern reaches of the river, or more particularly from Cairo down. Here the familiar steam shovel and dump car method is rarely seen. North of this, however, we occasionally find instances where conditions warrant the use of what has commonly come to be known as standard equipment. An instance of this is the work which is now going on under the East St. Louis Levee and Sanitary Board, just south of East St. Louis, Illinois. The lowlands along the Illinois bank in this vicinity have frequently suffered from inundation and an extensive effort is now being made to prevent this in the future.

John Keeley's 85-C Bucyrus digging stiff yellow clay, (note the teeth marks,) for enlargement of the B. & O. embankment in connection with the East St. Louis Levee project. The shovel averaged in this material, 3000 cubic yards per 10-hour shift, loading 30-yard Western dump cars.

What the Project Consists of

Seventeen miles of river front levee has recently been constructed under this plan, a good share of which was done by the well-known Chicago contractors, Yale & Reagan. The present project calls for the completion of the projected 20-mile levee by the construction of three consecutive miles from the southern limits of East St. Louis to one mile south of Cahokia.

John Keeley's Contract

The contract for this work, amounting to about $300,000 was let to John Keeley of East St. Louis in July 1915 and is now rapidly approaching completion, in spite of the fact that work was not actually started until October 15th owing to the time necessary for the Mobile & Ohio to make arrangements for temporarily abandoning portions of their track essential for routing dump trains.

This job consisted for the most part of the enlarging and raising of the embankment of the Mobile and Ohio Railroad. This enlargement work called for the moving of 800,000 cubic yards of material.

The Equipment Used

This yardage was moved by one shovel, an 85-C Bucyrus, working day shifts only. Serving the shovel were sixty 30-yard all-steel Western dump cars. In addition, Mr. Keeley had in service a Western standard-gauge spreader car. The hauling of the dump trains and the spotting of the cars was all handled by the O'Fallon-St. Louis Railroad under an agreement between that railroad and Mr. Keeley.

Description of Job—Output of the Shovel

Part of the material for building the embankment or levee was taken from the "Nigger Hollow" mine, owned by the O'Fallon-St. Louis railroad, which Mr. Keeley graded under special arrangement with this railroad for shop and storage track purposes.

A distance of about 14 miles lies between the pit and the dump. Under favorable conditions the shovel loaded an average of about eighty 30-yard cars in a day. In fact with skillful management one fourth of the entire yardage was moved by the time three months had elapsed.

The embankment is being raised eight feet on a base 120 feet wide with a crown of 20 feet. For a distance of about half a mile, slag is placed on the river side face of the levee and the top paved with limestone blocks. The slag is first raked down in order that the larger and heavier pieces are gathered together at the base. This surface is then filled with sand as a means of strengthening the levee proper. The slag is obtained from steel mills in East St. Louis and vicinity. The sand is a burnt moulding sand. Behind this 6,143,912 cubic yards of sand has been pumped in from the river in order to reclaim 150 acres of swamp land for terminal facilities.

Mr. Keeley has been awarded an additional contract by the Alton Southern Railroad Company for raising their embankment to a height equal to the M. & O. elevation. This calls for 150,000 cubic yards.

The original contract is part of a big project to protect this whole district known as the American Bottoms from a flood similar to the disastrous one of 1903. This project includes the construction of a complete drainage system of levees and canals. 3,670,000 cubic yards have already been moved by shovels, draglines and dredges. The excavation of a diversion channel calling for 1,427,000 cubic yards has just been started by A. V. Wills and Sons and Sternberg Brothers, both of St. Louis. The entire project will cost in the neighborhood of $6,000,000.

J. A. Smith is chief engineer for the district in charge of the work. We are indebted to Mr. Smith for much of the above information. Jos. Keeley is superintendent for John Keeley at the shovel and J. D. Johns, superintendent at the dump. The shovel is operated by Thos. Cook, engineer and Thos. Stevens, cranesman.

Maintenance of Brick Pavements

If brick pavements are properly constructed at the start, the work of maintaining them is very slight. Under the closest inspection, however, some inferior material is likely to become incorporated either in the foundation or in the surface, and it is therefore very important that a brick pavement be very carefully watched for the first few years of its life to see that no unevenness develops either because of defective brick having been used in the surface or because of insufficient support from the foundation at any point. Whenever any unevenness develops, it should be immediately rectified. Otherwise the pavement will become irregularly worn in the vicinity of the defects, and expensive repairs will eventually be necessary.

Not infrequently weak spots develop in broken stone or gravel foundations, owing to surface water finding its way through joints in the pavement which have not been properly filled with grout. Careful observation of the joints should therefore constitute a part of the early maintenance work, and any defective joints discovered should be immediately remedied. Where the foundation is constructed of concrete, however, slight defects in the joints seldom result in any very serious damage.

If care is exercised to correct all defects which appear within the first few years of the life of a well-constructed brick pavement, the work of maintaining the pavement proper should thereafter, except for cleaning, be almost negligible for a considerable period. The shoulders and drainage structures, of course, need occasional attention, just as in the case of any other pavement, but if they are properly constructed at the start repairs will usually be very slight.

The life of a well-constructed brick pavement cannot be estimated with any great degree of exactness, first, because the traffic conditions are constantly changing, and, second, because no brick pavement which has been constructed in accordance with the best modern practice has yet worn out. Such measurements as have been made of the amounts of wear sustained by given pavements during comparatively long periods of years have not been sufficient to warrant any very definite conclusions as to the probable terms of service, though they indicate that good paving brick wear very slowly under ordinary traffic. It is evident that in order to secure the full benefit of this excellent resistance to wear the surface of the pavement must not be permitted to become uneven because of the failure of a brick here and there.—From Bulletin No. 373 U. S. Dept. of Agriculture.

Dragline Work On the South River Drainage District No. 2

A brief description of Phelan-Shirley Company's contract with the above named drainage district calling for 1,114,000 cubic yards of excavation. Output of dragline excavator.

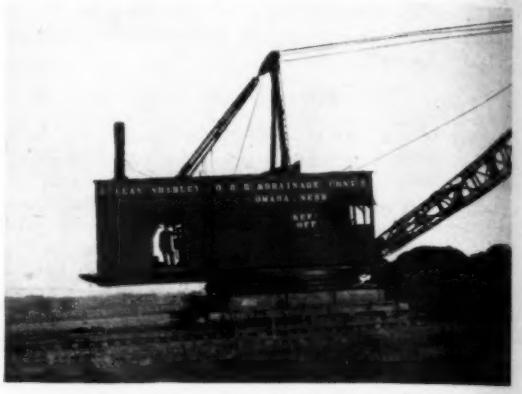
THE Phelan-Shirley Company of Omaha, Nebr. have had work under way since November 9, 1915, on a large contract for river straightening with the South River Drainage District, No. 2 at Clarinda, Warren County, Iowa.

This calls for the digging of 10¼ miles of canal with 1,114,000 cubic yards of excavation. This work should be finished early in March 1917, weather permitting.

The contract is divided into two sections. On section 1, a class-14 Bucyrus dragline excavator with a 60-foot boom and a 2-yard bucket has been in operation. On section 2, a class-20 Bucyrus dragline with a 70-foot boom and a 3 cubic yard bucket was used. Both these machines are mounted on skids and rollers. This latter section contains about 513,000 cubic yards of excavation and was completed December 9th of last year. This work was practically finished two weeks before, but delay was caused by the difficulty in obtaining permission to cross a farmer's land. This excavation consisted for the most part of clay, with some silt and loam with a sand bottom. All except one mile of the ditch has a 20-foot bottom and a ½ to 1 slope with a 7-foot berm. The remainder has the same slope and berm with a 24-foot bottom. The material was dumped on both sides of the ditch.

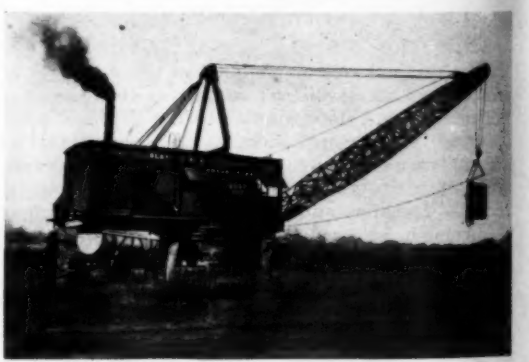
Phelan-Shirley Company's class-20 Bucyrus dragline in operation. This machine is equipped with a 70-foot boom and a 3-yard bucket.

Progress on section 2 in particular, has been very satisfactory and we print herewith a statement of the estimates of excavation accomplished by the class-20 dragline since the first of the year. The machine worked single shifts of about 11 hours each. The only problem encountered by the contractors was high water in the spring which naturally impeded the progress considerably. During the time of its operation, the class-20 has had to cross seven rivers and five lakes which took up about forty-five days of its operating time. A large number of bridges were encountered around which it was necessary for the draglines to move.



This view shows the method used in backing away from the work. A fairly clear idea can be obtained of the track sections which were laid on ties. It will be noted that the dragline is mounted on small flanged spool-shaped steel wheels, five on a side. These wheels run on 8-inch I-beams which are laid on 8-inch ties, and 3 by 12-inch plank which serve as the road bed.

Amil Parkening operated the class-20 dragline. James A. Craig was superintendent and A. S. Van



Another view of the machine just after having dumped its load. Note the water wagon which is used for bringing water to the machine.

Sandt, to whom we are indebted for the above figures, is engineer for the drainage district at Clarinda, Iowa.

Output of Class-20 Bucyrus Dragline on Section 2.

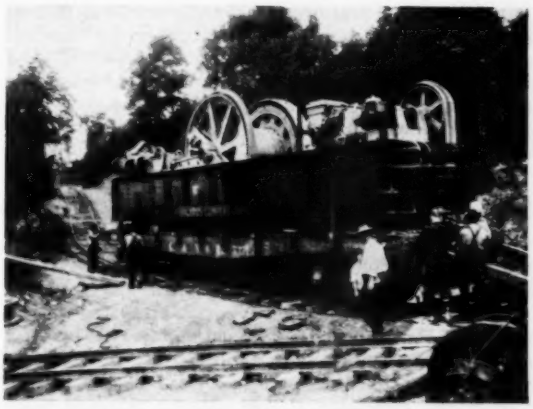
Date of Estimate	Cu. Yards Excavation
1–6–16	49,477.5
2–8–16	20,513.1
4–4–16	33,483.9
5–1–16	51,200.0
6–9–16	80,873.8
7–5–16	44,304.2
8–4–16	45,825.4
9–1–16	52,373.9
10–2–16	49,939.3
11–2–16	49,975.6
Total	477,966.7

Weather permitting the contract should be completed about March 1st of this year.

Hauling 340 Tons of Steam Shovel Machinery Up a 1000-Foot Hill

We publish herewith a number of views illustrating how the Adena Coal Company, of Adena, Ohio, got the machinery of their 225-B Bucyrus shovel, weighing close to 340 tons, as well as the rest of their coal stripping equipment, to their property. This property which consisted of about 90 acres, lies on the top of a high hill, 1000 feet above the railroad track in the mountainous coal

Coming up the second incline



Flat cars with a section of the revolving frame containing the main and swinging machinery, preparing to climb the second incline. Notice the switchback and the hoisting engine in the corner, which was used on the first incline. The men are setting in place the pieces of timber which act as brakes in case the load starts to run away.

Erection completed and shovel ready to dig. Note diminutive 35-B Bucyrus shovel beside its big brother and steel derrick used in erection, in background

mining region of Ohio, about 17 miles north of Wheeling, West Virginia, on the W. &. L. E. Railroad.

Their coal stripping equipment consisted of a 225-B Bucyrus revolving shovel which is being used for stripping the coal and a 35-B Bucyrus shovel for mining the coal, together with dinkies, cars and other equipment.

The latter shovel was erected on the railroad tracks and at once proceeded to dig an incline up this hill. This incline owing to the steepness of the hill was made in a switch back of two inclines, aggregating about 2700 feet, the first incline 1800 feet in length and the second about 900. The slope was so steep that it was impossible for the shovel to climb the hill without assistance. The method employed was to attach a cable to the frame of the shovel running it through a block attached to a tree ahead and back to the dipper. Pulling back the dipper would consequently, assist in pulling the shovel up the hill.

After the incline was dug, rails were laid and the machinery hauled up in flat cars and gondolas. Nineteen cars in all were hoisted, twelve of which consisted of the machinery of the 225-B shovel, totaling about 346 tons. In addition to this, dinkies, rails and other equipment were brought up. There was a hoisting engine at the top of the first incline and another at the top of the second. The first incline as stated, was about 1900 feet in length, the slope averaging from 15 to 18 per cent with occasional rises of about 20 per cent. A $\frac{5}{8}$" cable was used in no less than two parts. The second incline though shorter, namely 900 feet, was considerably steeper. In parts the slope was better than 30 per cent and the cable was used in four and five parts. Two cars were brought up at a time. These were unloaded and lowered, when two were brought up. Precautions of course were necessary to prevent a run-way in case of an accident. As shown in one of our views, two ties were fastened by their ends to the rear end of the last car. These ties dragged along the track behind the machine and in case the cars started to back up, would act as props to stop them. Chocks were also underneath and behind the rear wheels. The whole job was done in about nine days. Eichley and Sons of Pittsburg had the contract for hauling. The job was under the supervision of S. M. Downer, manager of the Adena Coal Co. After the contractors left the job, one car was successfully lowered by hand under Mr. Downer's direction.

The Adena Coal Company's 225-B Bucyrus shovel with its first cut well started. It will be noticed that the material is being dumped on both sides of the cut and that this cut is being taken around the side of the hill. Observe the teeth marks in the bank which indicate hard digging

The Excavating Engineer

A Monthly Publication Devoted to Excavating and Allied Subjects

Subscriptions, payable in advance, $1.00 a year for 12 numbers, 50 cents for six months.

To foreign countries, including postage, $1.00 a year or its equivalent, 4 shillings; 4 marks; or 5 francs.

Advertising copy should reach this Office by the 10th of the month before date of issue.

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THE
EXCAVATING ENGINEER PUBLISHING CO.
Bradlee Van Brunt, Manager and Editor
South Milwaukee, Wisconsin

The Crisis

There is one thing uppermost in every American's mind at the present time. The president has broken off diplomatic relations with Germany and as we go to press the same course with Austria seems to be inevitable.

It is difficult to appreciate how the tremendous strain that now exists can continue much longer. When the breaking point is reached, it will mean war. An authorized or an unauthorized action of one U-boat commander will bring us to this breaking point. It is impossible to ignore this. Moreover, there is a real source of peril in misunderstanding and misinterpretation.

While this tension exists, therefore, it is of the utmost importance for the people at large to exercise cool judgment and firm self-restraint.

No matter where our sympathies may have been previous to the break, every good American citizen should appreciate that our government could not have done less with honor. Germany has left us no other course to follow.

Our duty at the present time is two-fold; first, as we have already suggested, to go about our business with cool heads, and to support the Administration by word and deed, in whatever move it may see fit to make. Second, to set to work, not to-morrow, but now, to determine how each one of us can best serve our country should war come.

We can not afford to dismiss our responsibility with the idea that we cannot be invaded, and consequently, that we can safely "let George do it." If we go into this war, we must fight our own battles, we must not let others fight them for us. Any other course to the contrary is inconceivable.

You contractors, engineers and operators can be of inestimable value to your country. Many of you are young enough to enlist directly as first-class fighting men. Many more can be of greater value through your knowledge of your own profession. The army will need a construction corps. Your first move is to send to the Adjutant General for instructions how to become an officer in the engineering corps or the quartermaster corps of the reserve. Then apply for a commission. This will obviate needless confusion when the time comes. Your next action is to persuade the men over you or under you to do likewise.

If you will write the *Excavating Engineer* direct, stating your experience and qualifications, we will procure for you the desired information.

We hope most earnestly that the crisis may pass safely, but we hope even more fervently that should war come, future Americans will have cause to be proud of their ancestors.

The Construction Outlook

Road, street and municipal fields still continue to be very active and to promise good things for the contractor. The railroad field, however, is an enigma. As everyone knows, railroads are doing a tremendous business, and gross earnings have been greater than ever before. Despite this, recent reports show that the operating expenses have increased so tremendously that the net earnings actually show a decrease. For example, although the gross earnings of 417 roads for December 1916, increased over twenty millions of dollars over the same month 1915, net earnings decreased over three millions. Exactly what effect this will have is difficult to say. But we may as well realize that the increase in materials and cost of doing business will continue to increase until a general collapse comes in the prevailing high level of values.

G. H. Hutchinson Goes to Russia

Mr. G. H. Hutchinson the well-known Western Sales representative of the Bucyrus Co. sails on March 9th for Russia, where he is to look after the interests of the Bucyrus Co., in conjunction with the Bucyrus Russian representatives, the International Engineering and Trading Co., of Petrograd. The sale of excavating machinery in Russia has grown so tremendously during the last few years, that it has been thought necessary to have an expert such as Mr. Hutchinson on the ground. We know that his many friends will miss him very much. We expect, however, to publish regular letters from Mr. Hutchinson during his trip.

A Correction

On page 182 of our February 1917 issue, we published a view of the "Little Tugger" hoist, manufactured by the Ingersoll-Rand Co. of New York. In our legend underneath this view, its weight was given as 359 tons. This should, of course, have been 359 lbs.

This hoist, as stated, is manufactured by the Ingersoll-Rand Co., Bolling Green Bldg., New York, and is finding a large market in various fields of excavation work. A full description may be found in our February number.

Gen. George W. Goethals Opens Consulting Offices

Gen. George W. Goethals has opened offices in New York City and will engage in a general consulting practice in civil, electrical, mechanical and hydraulic engineering. His associates, who, with the exception of George M. Wells, have not as yet been announced, will be experienced specialists in their particular lines. Mr. Wells has just resigned as resident engineer in charge, Division of Building Construction, Panama Canal. The firm will give special attention to examinations and reports on canals, harbors, drydocks, terminals, dams, water-power development, water supply, purification of tropical waters, refrigeration, reinforced-concrete structures, organizations, management and public utilities. The offices are at 43 Exchange Place, New York City.

Removing Snags from Streams

By O. O. G. Means

Owing to the supply of glycerin from the European countries being cut off by the war, straight nitro-glycerin dynamites are abnormally high in price at the present time.

United States Government engineers in charge of river and harbor improvements had been using straight dynamites for the removal of snags and because of the abnormal price desired to adopt some cheaper explosive if it were practical.

What are known as ammonia explosives contain a little less than half as much glycerin as the straight grades; therefore, can be sold to the trade and to consumers at a considerably lower price per pound. Still the engineers were doubtful if the ammonia dynamites which are known to be less water resistant than the straight grades could be used in their work. In order to test this out, I went out with Mr. Marshall, (an assistant engineer in charge of the removal of snags from the tributaries of the Mississippi in what is known as the Vicksburg District,) and Mr. Wales, an expert snag blaster, to make a test of ammonia dynamite in comparison with straight dynamite for under-water work. It seems it is necessary to keep the dynamite under water for from fifteen to thirty minutes.

We took with us a case of forty percent low freezing ammonia and a case of nitroglycerin dynamite. Electric blasting caps were used as detonators. In this work, the snag blaster makes a band of dynamite which is fastened around the base of the stump under the water in which it is standing. In our first test, the dynamite was left under water for twenty-two minutes and when exploded with the blasting machine resulted in a perfect explosion and the blowing of the stump to pieces.

We then tried both the straight and ammonia dynamites on some willow snags under water and got as good execution with one as with the other.

The electric blasting cap was subjected to the same severe test as the dynamite. Ordinarily, a blaster buries the cap in the dynamite and it is protected by the parafined paper which covers the dynamite. In addition it is frequently further waterproofed with tallow, cap seal, or asphaltum paint. In these tests, the cap was merely tied on to the outside of the dynamite cartridge and was protected in no way whatever. It was left under water for twenty-two minutes the same as the dynamite. In spite of the fact that ordinary electric blasting caps are not warranted to stand such treatment, the caps we tried in this test proved fully equal to the unusual requirements and detonated the explosives charges perfectly.

The adoption by the Government of ammonia low freezing dynamites in place of the straight goods that have been previously used will result in the saving of hundreds of dollars per year. As many contractors not in Government employ are doing similar work, this information may be of interest to them.

When Jimmy Dugan Bunches His Job

By Charles Nichols Webb

When Jimmy Dugan says he's going' to bunch his job and go
(Jim is the dinky skinner at the Monitor, you know)
That he is goin' to quit the blasted old Mesabi range,
And why he has stayed here this long is mighty, allfired strange—
When Jimmy says he's goin' down to God's country to stay,
And that his brother's got the finest farm in Ioway,
And that the latch-string there is always hangin' out for him,
And that it's twenty years since last he saw his brother Tim—
When Jimmy Dugan gets his time and packs his little grip
We gather 'round and listen to him plannin' out his trip,
And, sometimes, all us boys chip in and buy some little thing,
A pipe, perhaps, or walkin'stick, or like as not, a ring.
We know that Jimmy's saved most all his pay for half a year
By skimpin' on tobacco and not even drinkin' beer;
We know he's planned the trip for sure and mighty anxious too,
To bunch his job for good this time and start the game brand-new—
But poor, old Jimmy Dugan has pulled off this stunt before,
And 'though we all pretend, we never fall for it no more;
For Jimmy will get loaded in the nearest joint and when
His half-year's savings have been spent he'll come right back again.

· FIELD NOTES ·

QUESTIONS pertaining to the operation, maintenance or repair of excavating machinery will be answered through this column. Address, Field Note Department, Excavating Engineer, South Milwaukee, Wisconsin.

Care of Machinery in Winter

It is not an uncommon thing to find steam shovels and other equipment, which has to be left standing on the job during the winter months, partially or wholly uncovered and exposed to the weather. The harm that results from this need not be emphasized. It is very short-sighted policy. Any engineer will, of course, see that the boilers are drained, that the bright metal parts are greased and the brass fittings, valves, lubricators, etc., are taken off and stored away to prevent their being stolen. It is very important, however, to board over as much of the machine as possible. When it is not possible to do this, heavy tarpaulins may be tied around the exposed parts. When you have finished digging, always back the shovel away from the bank, because the constant freezes and thaws always result in slides, which are likely to injure the machinery.

A Handy Chart for Weighing Excavated Materials

Simply lay a straightedge across this chart once and the weight of any excavated material may be found by reading the middle column, column C.

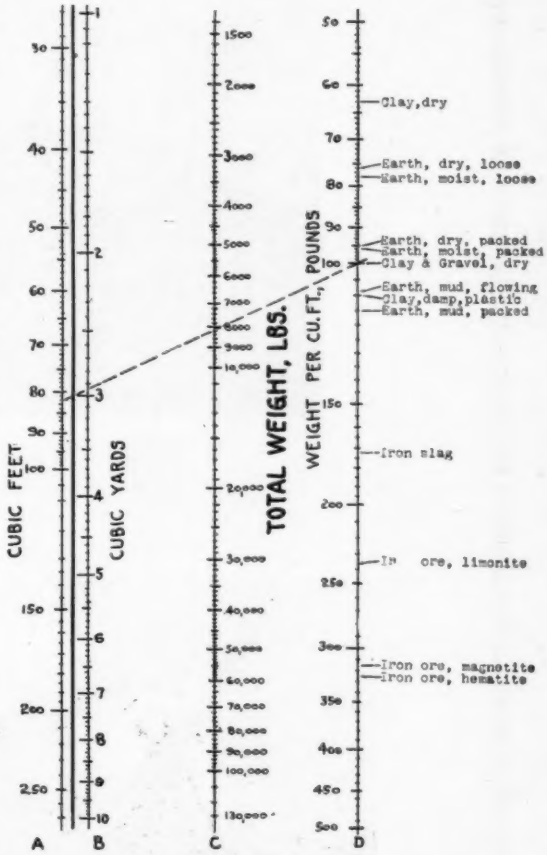
For example: What is the weight of three yards of dry clay and gravel?

Find the 3 in column B and from its point on the heavy black line between columns A and B run a line to the 100 (column D,) which is the weight of dry clay and gravel per cubic foot, and the result —8100 pounds—is found in column C. See the dotted line on this chart.

Whether the volume of material is given in cubic feet or in yards makes no difference, either is worked in the same way—always find the corresponding point on the heavy black line first and then connect with the weight per cubic foot.

In case the volume is 30 cubic yards instead of 3 all you have to do is to add another cipher to the result and the weight is 81,000 pounds instead of 8100 pounds. This chart is therefore capable of taking care of any yardage, no matter howgreat or small.

Even though you are excavating a material that is not listed here, the chart is usable, provided you know the weight of the material per cubic foot. Thus dry, loose sand and gravel weighs from 90

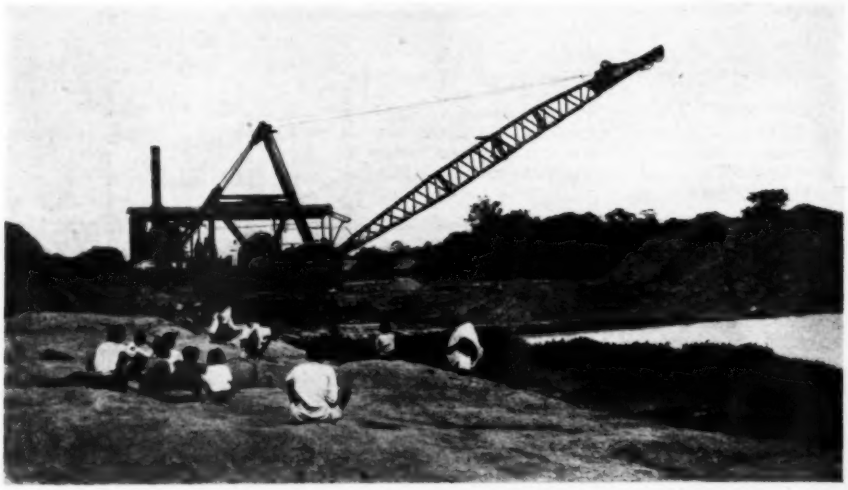


to 105 pounds per cubic foot and therefore cannot be listed on this chart with definiteness, but it is a simple matter for the engineer in charge of the excavation to determine the average weight of the particular material he is excavating and then apply the chart. Dry, packed sand, and gravel weighs from 100 to 120 pounds per cubic foot. Riprap weighs from 80 to 105 pounds per cubic foot, depending upon fineness or largeness, and whether it is sandstone, limestone, or shale.

This chart therefore serves a double purpose. It gives the weights of the most common excavated materials per cubic foot and it is ready at any time for weight computations.

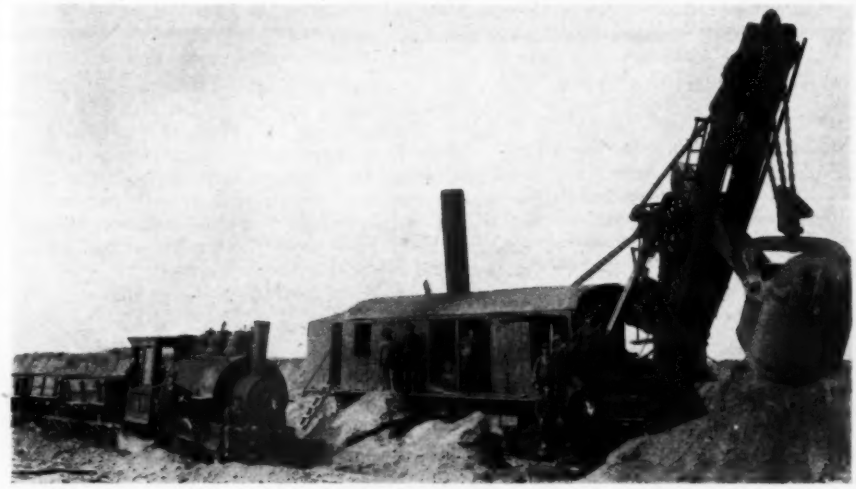
Photographic copies of this chart, 10 inches high by 7 inches wide, may be obtained for $.60 each by writing the *Excavating Engineer.*

N. G. NEAR.



A 175-B Bucyrus dragline with a 6-yard dipper and an 80-foot boom owned by the Siamese Government at work on the great Prasak Irrigation Scheme, at Dhe Luang, Siam. 200 to 300 natives daily sit and watch this machine work. From the position of the gentlemen on the right, one might infer that the sun is hot. Within a week after completion of erection this dragline was digging 79 buckets an hour. C. E. King is in charge. A 12" Bucyrus suction dredge is being installed and a 16" dredge is on order for the same project.

These two views give an excellent idea of the work which the Clemens Coal Company's 225-[illegible] shovel digging, and the left hand view was taken a few seconds after when it was depositing [illegible] consists of tough gray shale, which as the perpendicular wall shows, is of a very solid formation. [illegible] running into an old cut which will be cleaned out to the far end. The shovel will then be turned [illegible] then be deposited into the old cut after the coal has been removed. The coal is 32 to 34 inches thick [illegible]



Arthur A. Johnson of Flushing, N. Y., at work on his 200,000-yard Thompson Hill contract on Queens Boulevard, Long Island City, grading for real estate development. Walking boss, Pete Snyder. Engineer, Martin Hohn. Cranesman, Tom Cavanaugh. Dinky skinners, Pat Moroney and Mert Vaughn. A Bucyrus 70-ton shovel, 32 4-yd. Western cars and two Vulcan dinkeys were used. Job is to be finished June, 1917.

225-[illegible]yrus revolving shovel is doing near Minden, Mo. As may be seen the right hand view shows the [illegible] on the bank. The shovel is in a box cut about 30-ft. deep. The material as may be seen, [illegible]. The shovel has frequently dug 4,600 cubic yards of this material in 9 hours. The shovel is just [illegible] and started on a new cut, working back on the left hand side. The excavated material will [illegible] of the best quality.

DEVICES YOU OUGHT · TO KNOW ABOUT ·

Knox Tractors and Troy Trailers to Haul in Big Cottonwood

For some time the Cardiff Mines in the Big Cottonwood District of Utah have been face to face with a serious condition which confronted them in finding an economical and successful method of taking their ore from the mines to the smelters in Salt Lake Valley, and of bringing back coal and other supplies.

Formerly hundreds of teams were used for this purpose, but the expense finally became prohibitive. Gasoline trucks and track-layer tractors were tried out, but the conditions of haulage in the canyon were such as to make both these methods impracticable. It seemed for a time that the only answer to the question was to build a railroad down the canyon.

The owners of the mine, however, were prevailed upon by the Utah-Idaho Motor Company to make a test of the tractor-trailer combination. Eleven consecutive demonstrations proved satisfactory in every way. To those interested in this character of transportation, the following brief synopsis of results of these eleven demonstrations will be of interest.

The equipment consisted of one model 36 Knox tractor with five-ton ore body, and two five-ton Troy trailers, equipped with regular steering apparatus, roller bearings, and 36 x 7-inch rubber tires.

On the down trips from the mine, the trailers were practically always held back by the brakes on the tractor, this being a remarkable performance owing to the fact that in many places the grades are as steep as 16 per cent.

Traffic was never interfered with in any manner, because of the fact that the Knox tractor could pass as easily as the ordinary automobile, the Trailers following absolutely in the tracks of the power plant.

The tractor was equipped with steel wheels fourteen inches wide, which were fitted with diagonal cleats. After the eleven trips up and down the canyon no appreciable wear was noticeable on the tires.

Some of the demonstrations were made during heavy rain storms, and no difficulty in negotiating the trip was encountered at any time.

The total tonnage of ore hauled during these eleven demonstrations was 272,660 pounds, and although coal was not taken back on every return trip, a total of 27,080 pounds of coal was hauled back from the valley to the mines. The amount of coal hauled per trip ranged from 3,600 to 4,300 pounds.

An average gas consumption of twenty-one gallons per round trip was registered, and the round trip consumption of oil averaged two quarts.

Two trips were made every twenty-four hours, the average time coming down being three and one-half hours, and returning four and one-half hours, which, with allowance of one hour for loading and unloading, gave three hours for oiling, taking on gas, and inspecting the machine.

No repairs of any nature were necessary during the eleven trips.

Knox tractor and Troy trailers descending a steep grade under perfect control.

The distance covered on each trip down include nine miles in the canyon proper and seven miles across the valley, which included one very steep hill.

One of the most remarkable features of the demonstration was the fact that during none of the demonstrations was it necessary to add water to the radiator on account of heating. The radiator showed signs of boiling at no stage of the demonstration. Considerating that a rise of 3,050 feet is negotiated in this trip of sixteen miles, seven of which is across the valley, the fact that the radiator did not overheat is even more remarkable. The difference in altitude seemed to make no difference whatever in the power of the Knox tractor engine.

When seen after the tests, Ezra Thompson, president of the Cardiff Mining Company, said: "It is true that most every sort of transportation method has been attempted to bring the ore down from the Cardiff mine, and many companies have expressed, the utmost faith in their particular method of handling the ore, but we have so far seen nothing that will even approach the Knox tractor for efficiency, safety, speed and economy. One of the features that particularly impressed me in the Knox tractor demonstration was the fact that the machine is absolutely under the control

of the driver on even the steepest grades. I have seen the driver bring the Knox tractor hauling eighteen tons of ore to a complete stop within ten feet on the steepest grades in the canyon.

This absolutely assures the safety of pedestrians and other drivers on the Big Cottonwood road.

"We believe the transportation problem has now been finally settled, and that there will be no more agitation of the question."

The United States Transportation Company is now engaged in hauling ore from the Cardiff mine to Sandy, and is using Knox tractors and Troy trailers exclusively. It reports utmost satisfaction with the performance of these hauling units, their records showing an average of twenty tons of ore each trip, and the company states that the schedule of the trips does not vary seven minutes.

Lights for Night Work

Wherever it is necessary that night work should be done, the first requisite is a good light, and for contractors the light should be simple, portable and low in operating cost.

The makers of the Buckeye Oil and Carbide Lights have been developing this form of light for twenty years and surely ought to know what is necessary in a light of this character.

The Buckeye Carbide Light is the final result of this long experience and it will be found to fill the bill for the following reasons:

1st. Using ordinary carbide that can be procured almost anywhere.

2nd. Carbide made in cake contains foreign material as a binder reducing the producing gas capacity per unit weight and, therefore, increased cost of operation.

3d. Lights using cake carbide are more expensive in the long run due to high unit cost of gas and high maintenance cost resulting from lack of self-cleaning features.

4th. The Buckeye Carbide Light was the only light of this character that received a Gold Medal, the highest award at the Panama American Exposition at San Francisco.

5th. The Buckeye "Challenge" Light will use cakes as well as the regular commercial carbide, thus a customer could test both out with the same light and prove whether this statement is right or not.

6th. Buckeye Carbide Lights (not the Challenge) have in the base of the tank a gas cleaner or filter which washes the gas, cools and purifies same.

7th. The cost of running a Buckeye Carbide Light of even candle power is about one-half the cost of operating a light using cake carbide, thus a customer quickly pays the first difference in price.

The Challenge Light mentioned is a modified form of the Buckeye Light but made up in a cheaper form. These lights are made in a variety of designs to suit special work, also made up for headlights, as shown by the illustration herewith.

An important improvement in the Headlight is the provision made for rough jolting, such as a contractor's locomotive gets all the time.

The MacLeod Company, Cincinnati, will be pleased to answer any inquiries relating to their equipment and to give strong guarantees covering same.

The Buckeye Carbide Light

REVIEW OF BOOKS and CATALOGS

We shall be glad to review, in this column, such books and catalogs as are sent to us. Books reviewed in these columns will be supplied by The Excavating Engineer Publishing Company at the price named.

MOTOR TRUCKS OF AMERICA. Volume 5, 1917, 7 x 10, 164 pages and cover. A splendidly illustrated book containing much valuable information for motor truck operators. The demand for the last volume was unprecedented from men in all walks of life. This book we feel is of great value to any one contemplating the purchase of a truck, as it contains abstracts of specifications of all the well known makes of trucks manufactured in this country. We consider it an extremely valuable reference book. It is prefaced by an article entitled "Lengthening the life of the motor truck," by S. V. Norton, manager of truck tire sales, of the B. F. Goodrich Co. This book is sent free to anyone inquiring on his business letter head of the B. F. Goodrich Co., Akron, Ohio.

GRAMM-BERNSTEIN. Catalogue, 9¼ x 12¼, 30 pages and cover. A splendidly illustrated, well gotten-up catalogue describing the various sizes of Gramm-Bernstein motor trucks. Gramm-Bernstein Co., Lima, Ohio.

SHOTS FROM THE · FIRING LINE ·

Alaska

The closing of 1916 saw approximately 156 miles of track on the Government's Alaska Railroad completed. This includes 71 miles of the old Alaska Northern out of Seward, which has been reballasted, together with practically 85 miles of new road built by government forces. The new road includes the extension north of Anchorage, of which part is a branch running into the Matanuska coal fields. Twenty-five miles of this branch are constructed and twelve more remain to be finished next year, which will complete the line for the present. Work on the Fairbanks line has progressed at a good rate. Many of the heavy materials to be used in next year's construction will be transported to the different sections of the route this winter while the streams and trails are frozen solid, making transportation a more easy matter

Arizona

Harry H. Garner is operating a class-7 Bucyrus electrically operated dragline excavator for the Ray Con. Copper Co., at Hayden.

California

The installation of electrically operated dredges at Hanlon Heading on the Colorado river, about seven miles below Yuma and on the California side, has created much interest. It is here that the immense volume of water required for irrigation purposes in the Imperial Valley is taken from the river and at certain seasons of the year serious loss is caused the farmers by the silting up of the canals and the corresponding water shortage. To remedy this annual condition the Imperial Irrigation District has arranged for the installation of two and possibly four electrically operated dredges of 650-H. P. each, the power for which is to be furnished by the Coachella Valley Ice & Electric Co., which is a subsidiary of the Southern Sierra Power Co. A sixty-mile 55,000-volt transmission line is now being constructed between El Centro and Hanlon Heading, and it is expected that the dredges will be in operation by April 15, 1917.

Twohy Bros., well-known railroad contractors of Portland, Ore., and San Francisco, have begun work on their million-dollar contract for a 20-mile extension to the San Diego & Arizona Railway in southern California. Most of the equipment is on the job, having been shipped from the northern part of the state, where the company has recently completed a big dam at Smart.

Work will be carried on largely by steam shovels and dinkey trains. Mr. Twohy says the work will be pushed vigorously, that between 800 and 1,000 men will be employed when the work gets well under way, and that it is expected that the job will be finished in eight months.

Leroy Little, Calexico, was awarded contract at about $85,000 for constructing a connecting canal between Cudahy check and Cerro Prieta canal for the Imperial irrigation district.

San Francisco and Vicinity

BY F. W. SCHUMACHER

Frank L. Norman who recently resigned position as superintendent of steam shovels for the Chino Copper Co., is now regularly installed in Los Angeles. He has purchased a home there and says he is going to lead a better life. We somewhat doubt this statement judging by what we have learned while associating with him on a recent visit to this city. Norman drank his chicken sandwich. However, the quiet Los Angeles life will probably be of considerable benefit to him for awhile. The motion picture industry seems to attract the handsome men to Los Angeles. Norman insists that he is better looking than Hutch but we do not like to venture an opinion as we do not want to make Hutch sore.

G. H. Hutchinson, Western Sales Manager, San Francisco and L. T. Russell, Northwestern Sales Manager, Portland, have just returned from a visit to the Bucyrus plant at South Milwaukee.

Fred Stowell is around again trying to locate so he can procure the "staff of life."

This office is getting all "cluttered up" of late with near and idle rich. We hope the season opens up soon so we will be able to place them as muckers.

William L. Gerry has just finished firing on a shovel job and is looking for a new connection.

Harry Sweet has returned from Ruth, Nev., and is stopping at the Baldwin House.

It is rumored that Bert Van Horn is working his way back to the Coast. This is to advise that the "Coast" is most quiet now.

Contract for construction of about 3½ miles of highway work was recently awarded to Scott & Turner at Placerville, Cal.

C. Moreing has secured an oil macadam job on the Durham Ferry Highway. Contract amounts to about $26,000.00.

Contract for grading road bed for 12-mile extension of Southern Pacific Railroad from Calipatria to Westmoreland has been awarded to Jackson & Lockhart, Brawley, Cal.

R. E. Coleman is firing a 70-ton shovel at Andrade, Cal., for M. D. Goodbody.

J. K. Wilson is operating Moffett & Meade's shovel at San Diego, Cal.

E. L. Knight has been operating a "New Home Sewing Machine" near the town of Vallejo and has returned to San Francisco and now wants to run a Bucyrus. Charles Collins who was working for him has managed to keep ahead of the authorities thus far, but you can't always beat the game.

A crew consisting of B. E. Scott, engineer, W. Pendell, cranesman, and J. C. Callahan, fireman, left this morning for the Calaveras Dam to operate a model-31 for the Spring Valley Water Company.

Palmer & McBryde have temporarily shut down their work on the Western Pacific and have moved a part of their crew to their Calaveras Dam work until the weather will permit resumption of the railroad work.

William Gruver, formerly superintendent for Palmer & McBryde, is in San Francisco for a short time.

A large amount of street and highway work has been let in the Bay Districts but the contractors are delaying the starting of work until they feel more confidence in the weather. To date there is a deficiency of about four inches in the rainfall and the prophets cannot agree as to whether it is a dry season or one of late rains. The indications are that there will be a heavy demand for construction men of all classes in this district within two months.

G. W. Boschke, vice-president and general manager for Twohy Bros., is spending the most of his time on their work near San Diego.

W. A. Bechtel has been down on the border looking over the San Diego & Arizona work.

The Utah Construction Co. has taken the contract to complete the last twenty mile link of the San Diego and Arizona R. R. Their work is between that taken by Twohy Bros. and the east end of the completed road.

Mr. John H Tweedy, Jr., a director of the Bucyrus Company, and family spent several days in San Francisco recently and was a caller at this office.

The River Rock & Gravel Company has purchased the 60-C Bucyrus Electric Shovel from the U. S. Reclamation Service which was laid up after completing work on the Lohanton Dam in Nevada. They are now setting up the machine for use in their gravel pits near Tracy, Cal.

A. J. & J. L. Fairbanks of Willets, Cal., have taken a contract from the Marin Municipal Water District to construct four miles of road. The work includes 40,000 yds., of shovel work and 10,000 yards of team work.

Clarence Young, George Snoreen, A. Perrick and Joseph Moore left for Twohy Bros.' work at Andrade, Cal.

Local No. 29 has been organized in San Francisco with the following officers:

J. A. Sullivan, president; Charles Carney, vice-president; W. L. McClune, secretary-treasurer; James Putman, Frank Young, R. A. Burns, A. V. Bechtel, trustees.

The office is located at Room 1006, Hewes Bldg., San Francisco.

International President Welsh of the International Brotherhood of Steam Shovel and Dredgemen was in town for two weeks and has left for Seattle.

J. J. McGinnis, Joe Lacey, J. A. Sullivan, J. A. Hudner, O. Ruff, F. J. Coultrip, F. C. Ederly, J. A. Johnson, Thomas Boyd, and D. W. Hake are in town and can be located at the Baldwin House and elsewhere.

Bill Geraghty is craning a Bucyrus at McNear's Point for the Daniels Contracting Co. Jim and Pete Smith are also there.

Dalt C. Reynolds, who has been in the steam shovel game for thirty years, favored us with a call.

Canada

Montreal and Vicinity

BY R. ST. JOHN

The following information regarding work on the new Northern railways has been given out by Mr. J. D. McArthur president of the Edmonton, Dunvegan & British Columbia, and allied railways; steel is being laid on the Alberta and Great Waterways Railway at the present time at the rate of one mile a day. Steel for the 50-mile extension of the E. D. and B. C., a main line from Spirit River to Pouce Coupe, has been purchased in the United States, and will be laid early in the spring. This year's programme will include the ballasting of the only unballasted part of the main line of the E. D. and B. C., a distance of 17 miles east of Spirit River, the ballasting of the Grande Prairie branch, the ballasting of the main line extension from Spirit River to Pouce Coupe and the ballasting of the A. & G. W., to McMurray.

The importance attached to good roads in the Province of Quebec is indicated by the fact that the largest item on the programme of the session recently opened, outside of the gift of one million dollars to the patriotic fund, is the good roads expenditures. The government will provide further funds for a continuance of the good roads policy, and announcement of a loan to that effect is shortly to be expected. Conjointly with this continuation of the policy to improve roads, the government, it is reported, intends to take definite steps towards seeing that the roads, provincial and local, are kept in a proper state. In regard to provincial highways, and the four big highways now completed, legislation will be passed to provide for their maintenance. Contrary to expectation, the government will not assume the sole cost of the upkeep of these highways, but the bill to be introduced will provide for a division of the cost. These four highways are the Quebec-Montreal, the Levis-Jackman; the Sherbrooke-Derby line, and the Montreal-Rouse's Point, or the King Edward highway, as it is better known. The latter road, while completed some time ago, has been in need of repairs, and the proposed legislation will provide for its repair, and also to prevent the other highways from being neglected.

Vancouver and Vicinity

BY A. G. BROWN

A. E. Griffin, of the firm of Foley, Welch & Stewart, Vancouver, B. C., has been asked to report at once in England. He is to be given charge of a corps of railway construction men. The appointment has been made by Col. J. W. Stewart, deputy director of light railway construction in France.

F. J. Glover, municipal engineer, Langley, B. C., has enlisted for overseas service, and will leave for England in about six weeks' time, in charge of a tunnelling company, with the Engineers of North Vancouver.

The Swenson Engineering Corporation, whose head office is in Seattle, Wash., has been registered in British Columbia as an extra-provincial company, and will carry on business in this province, with head office in the city of Vancouver. The capital of the company is $50,000.

At a recent meeting of the Nelson, B. C., Board of Trade a resolution was passed urging Dr. King, the new minister of public works for British Columbia, to complete the unfinished portion of the transcontinental highway in the coast province. This highway runs through Medicine Hat, Lethbridge, Fernie and on to the coast via Nelson, Rossland, Trail, Grand Forks, Princeton and Chilliwack.

Lieut. Ronald Hayward, son of Mr. R. F. Hayward, general manager of the Western Canada Power Company, Vancouver, B. C., who joined the Royal Horse Artillery in England, was recently killed in action at Salonika.

Contract for the erection of a roundhouse at East Lillooet, B. C., for the Pacific Great Eastern Railway has been awarded to A. G. Creelman & Company, Vancouver.

The new government wharf, which has cost $2,500,000, and which has been presented as a gift by the Dominion Government to the City of Vancouver, was thrown open to business recently. The new wharf is 800 feet in length by 300 feet in width, and along nearly its full length runs a shed 700 feet long by 80 feet wide. On the elevator or west side seven railroad tracks are laid, while on the east side it is intended to lay one.

Under the direction of the Dominion Government, Mr. George Burnett, a Vancouver engineer, has just completed an exhaustive investigation from the standpoint of physical valuation and other phases of the Canadian Northern & Grand Trunk Pacific Railways between Edmonton and the Coast. The investigation also covered some branch lines in Alberta. Mr. Burnett expressed the belief that for the present at least one track should certainly carry the traffic of both railways between Edmonton and the Rockies.

Following the decision of the Board of Trade to resume the agitation for the immediate construction of the proposed drydock at Esquimalt at an early date, a committee of prominent citizens of Esquimalt have drawn up a memorial which it is intended to circulate for signatures and afterwards forward to Hon. Robert Rogers, Minister of Public Works at Ottawa, urging the immediate carrying out of the scheme.

It is rumoured that the Great Northern Railway is considering plans for the electrification of their lines into Vancouver, as well as other lines in Washington, U. S. A. The work proposed will take three years and electric energy will be developed in the Hope Valley district.

Fred Walgren, who with Clarence Walgren, his brother, were operating a class-20 Bucyrus for the Winnipeg Aqueduct Construction Co., Ltd., is now at Gratiot, Wisconsin.

Cuba

George W. Williams who has been sequestered with the Comoa Quarry Co., near Havana is still sequestered. The appeal of his "better half" published in our last number has evidently born fruit, as we learn that she is now with him in Havana and life is again going smoothly.

Florida

The Crow Excavating Co. is operating a 175-B Bucyrus dragline near Mulberry, Fla., removing overburden from a phosphate deposit. H. G. Harris is superintendent of the plant, W. E. Bryant is engineer, C. M. Simmons is firing. The shovel is operating one shift.

Foreign

Australia

The two 70-C Bucyrus shovels supplied to the New South Wales Government have, for some considerable time past, been operating upon the excavation of a large new reservoir being constructed by the Metropolitan Board of Water Supply and Sewerage, Sydney, at Potts Hill. This reservoir will contain about 150,000,000 gallons when completed, and will cover an area of approximately 48 acres.

Unfortunately the excavating costs have not been kept separate from the hauling and dumping costs, but it may be of interest to state that one of the 70-C shovels up to the 4th of November last, excavated 580,589 cubic yards and the other 70-C shovel excavated 440,907 cubic yards. The total costs of excavating, hauling and dumping the spoil were respectively 1*s* and 1½*d* per cubic yard. Of these totals it is estimated that only about 2½*d* per yard should be debited against the shovels.

About 2′ has been left all over the floor of the reservoir the main excavation of which is now practically complete, so that the weight of the 70-C shovels and the action of the weather may not disturb the final surface upon which the cement floor is to be laid. This surface will be obtained by stripping the final 2′ with the Bucyrus class-14 dragline which was delivered to the Metropolitan Board of Water Supply and Sewerage about a year ago. This dragline was erected upon a piece of temporary construction work near Sydney when delivered and has just lately been transferred to the site of the Potts Hill Reservoir.

The resident engineer in charge of the construction of this reservoir is Mr. A. F. Jacobs, to whom we are indebted for the above information.

Georgia

C. W. Lane & Co., Inc., of Atlanta, have a three million yard contract for revising and double-tracking the Southern Railway between Toccoa and Ayersville, Georgia which is expected to be finished sometime this year. They are using eight shovels in all on the work, of nearly all makes. Namely, Bucyrus, Osgood, Atlantic, Marion and Vulcan. The dump cars are 12-yard Western and Oliver, 6-yard K. & J. and 4-yard K. & J. and Oliver. 13 locomotives are in service. There is 250,000 cubic yards of concrete on the job. L. C. Harris is general superintendent.

Avery Brothers of Morgantown, North Carolina, have a subcontract under C. W. Lane & Co., Inc., on the Southern Railway revision mentioned above. They expect to finish a 30,000 cubic yard rock cut in March.

Kansas

Pittsburg and Vicinity

BY W. S. RUSSELL

During the past month we have had one or two spells of zero weather for a day or two and a few light flurries of snow, but no rain, the country is very dry with most of the creeks and ponds dried up, causing many farmers and others to haul water for their domestic use and for their stock. We note Oklahoma, has had several days of rain and show during the past week which has saved the wheat crop in that state.

The coal market still holds good although the excitement caused by the unusual demand for the past two months has subsided and the business has assumed more normal conditions. The car shortage is still in evidence and the railroads are behind in moving general freight as promptly as it should be and many complaints are being made by shippers.

We note reports from trade journals that severe weather in the northern and middle states has caused a serious condition generally, in the coal trade. Pittsburgh, Pa., Buffalo, Detroit, Toledo, Columbus and Cincinnati, are having zero weather, blizzards and snow causing a rush for emergency coal supplies, and owing to the congested condition of the railroads and car shortage there has been great distress, factories have been compelled to shut down or run from hand to mouth, and it has been difficult to obtain enough coal to keep public institutions heated, while prices are higher than ever known.

We quote prices on bituminous coal in the Kansas field as follows: Lump, per ton, $3.50; Nut, per ton, $3.50; Mine run, per ton, $2.75; Mill run, per ton, $2.25; Slack, per ton, $1.75, F. O. B. railroad cars at the mines.

In the Pittsburg field, comprising 4 counties, Cherokee and Crawford in Kansas, and Barton and Bates in Missouri, there are 52 coal stripping steam shovels located and nearly all working, the high price of coal has stimulated this method of coal mining and several parties are figuring on going into it.

The Pittsburg, Oskaloosa Coal Company have installed their model 250 Marion steam shovel on a 320-acre field at Oskaloosa on the Kansas City Southern R. R. and started stripping last week. The overburden varies from 8 to 26 feet in depth; the coal vein is 28 inches thick, of the best quality and is free from horsebacks.

The general office of the company is at Pittsburg, H. Degan is president, John Elwood general manager and Lewis G. Schmaltz, superintendent of field operations.

J. F. Ellsworth has severed his connection with the Ellsworth-Klaner Construction Company and he and John A. Meyers, former bookkeeper for the same firm, have bought a controlling interest in the Mulberry Coal Company operating a coal stripping plant at Ardath, 4 miles south of Mulberry on the K. C. S. R. R. The field consists of 180 acres lying quite level and advantageous for stripping. The overburden varies from 10 to 26 feet in depth, the coal vein is 28 inches thick of the best quality. J. F. Klaner is general manager and Jno. A. Meyers, secretary of the company, at Mulberry, Kansas.

The Domestic Fuel company are operating a 225-B Bucyrus steam shovel on their 260-acre field about 4 miles northeast of Mulberry. The overburden is from 12 to 28 feet in depth consisting mainly of a tough gray shale which is easily dug with the powerful shovel, the coal vein averages 32 inches thick and is of the best quality, Chas. M. Sweeney is general manager with an office in the Globe Building, Joseph Johnson is superintendent of field operations.

The Bonner Portland Cement Company of Kansas City are installing an 85-ton Vulcan steam shovel, purchased from the Bucyrus Company at their Cement plant at Bonner Springs, Kansas, for the purpose of stripping the quarry, which is the finest in the country, and has an almost unlimited supply of rock and shale especially adapted for making the finest grades of Portland cement. To Henry McGrew, president and manager, is due the credit of bringing the business to its present satisfactory condition. Phil Rouse, erecting engineer for the Bucyrus Company, had charge of installing the shovel.

The Fleming Coal Company of Pittsburg are stripping a field of 130 acres at Skidmore, Kansas, with a 175-B Bucyrus steam shovel in about 26 feet depth of overburden consisting of gray shale which is not hard to dig. The coal vein is about 3½ feet thick being the best quality of Cherokee lump. Ira Fleming is general manager with Alex Wallace superintendent of field operations.

Ed Roberts, general superintendent of the Sheridan Coal Company at Mulberry, came down to Pittsburg one day last week to confer with officials of the company.

Joe Fletcher, manager for the Jackson and Walker coal interests, came down from Frontenac for a day recently at Pittsburg and vicinity.

D. W. Jones, secretary of the Clemens Coal Company, was in Kansas City on a business trip recently, and took in the Automobile show, which he said was the finest he ever saw.

W. D. Leonard, of Kansas City, the well-known representative of the Leschen and Sons Rope Company of St. Louis, spent several days in Pittsburg and vicinity last month where he rounded up a lot of his friends and booked a number of orders for this popular brand of wire rope for the mines and coal stripping steam shovels.

W. J. Lester, manager the Sherwood-Lester Coal Company at Liberal, spent a day in Pittsburg last month on his return from his eastern trip; he reports extreme cold weather for several days while in New York.

Captain Dan Miller, superintendent the J. R. Crowe Coal Mining Co., came up to Pittsburg on business last week.

W. C. Shank, chief engineer of the J. R. Crowe Coal Mining Company, is now a resident of Pittsburg.

There are good opportunities for parties having means to engage in coal stripping in the Kansas field. Strip coal land can be bought or leased at reasonable prices and there is good money in the business. Further information will be furnished by addressing W. S. Russell, Stilwell Hotel, Pittsburg.

The Bucyrus Company have a stock of repairs for their coal stripping steam shovels at the W. J. Sullivan Machinery Company store room, which is a great convenience to operators of Bucyrus steam shovels.

The W. L. Sullivan Machinery Company are located on 7th Street near Broadway, where they carry a large stock of miners', mill, railroad and contractors' supplies. They are dealers in machinery, engines, boilers, pumps, motors, etc., for either steam, gasoline or electric. Also have repairs for Bucyrus steam shovels. Mr. Sullivan will give his personal attention to the wants of his customers.

The Hughes Stone Company, 208 East Third Street, Tulsa, Okla., have for sale a model-36 revolving steam shovel, one yard dipper, all in first class condition and working order, having been used only 8 months in their quarry. Price and terms reasonable.

Louisiana

W. G. Caples, who has been appointed major of the First Battalion, Second Regiment of Engineers, in the field in Mexico, has been in charge of the Fourth Mississippi River District at New Orleans since 1914. Following his graduation from West Point in 1901, Major Caples' duties led him into the Philippines, where for two years he was engaged on road work and surveys for military posts and waterworks systems. After returning to the United States in 1903 some of his various duties to the date of his last appointment were road mapping, dredging operations, the design of snagboats and dredges and the development of processes of military lithography and sketching.

New Orleans and Vicinity

BY THE BYRONS

Reports from the Third District Mississippi River Improvements say that the two large levee building machines *Bonaparte* and *Bourbon*, have been doing great work at "Ashbrook Neck" Miss., but are now shut down on account of high water.

D. B. Gore Co., Inc., of Baton Rouge are installing there class 225-B and 18-B caterpillar shovels on their coal property at Taits Gap, Ala. This machines must be taken up over Blount Mountain to the mine which is a large undertaking, but under the supervision of Mr. Geo. Moore, superintendent, the Taits will no doubt be accomplished.

Mr. Geo. E. Moore, formerly in charge of Bucyrus dredges Nos. 3 and 5, for D. B. Gore Co., Inc., of Baton Rouge, La., has been sent by that company to Taits Gap, Ala., to take charge of their large coal mining operation at that point. Mr. Moore has built himself a home on the top of Blount Mountain from which on a clear day the Lookout Range of mountains one hundred miles away can be seen.

All the brown ore mining outfits in the Birmingham district are working over time to keep the mining process in operation. The coal business in the Alabama fields is on the boom and a greater tonnage of coal is being shipped at this time than any other time in the history of the field. This is occasioned partly by the enormous demand for high grade coal and the many "open pit" operations in the district that have recently been opened. Car conditions are much better also.

Your correspondent has just had a pleasant visit from Mr. W. M. Smaill of Winnipeg, who is general superintendent of the Winnipeg Aqueduct Construction Co. of that city, and which company have the contract for the construction of eighty miles of concrete pipe line for the purpose of furnishing water to the city of Winnipeg. This work is similar to the great New York Aqueduct, also the one at Los Angeles, Cal.

There are several Bucyrus machines being used on this construction, consisting of seven class-7, one class-14, one class-20 and one class-24 dragline excavators. The company last week placed an order for two Bucyrus 18-B steam shovels to be used on this work so that next year there will be 12 Bucyrus machines employed on this work. Mr. Smaill reports the work progressing very nicely in the face of the fact that the mercury occasionally drops down to 40° below zero.

S. M. Perry, of Mobile, has recently left for Preston, Cuba, to operate a class-7 Bucyrus dragline sold to Mr. H. M. Fields, through the New Orleans office of the Bucyrus Co. Mr. Fields has extensive work in Cuba and Honduras for the United Fruit Co., and maintains an office in New Orleans.

Mr. W. D. O'Bannon has taken a position with the Crow Excavating Company, operating a Bucyrus class-180 dragline at Mulberry, Fla. Mr. James Harris is in charge of this work.

Grasser Construction Co., of New Orleans, are expecting their class-24 Bucyrus dragline most any day. They will install this machine on their levee work near Innes, La.

The J. F. Dale Sand Co., of Lagrange, Tenn., have more orders for sand than they can handle, but are making preparations to increase their plant to accommodate their fast growing business. They expect to have a daily capacity of 1000-yards of sand per day. Their sand is of a very high grade quality.

Anyone in the southern states wanting first-class dragline and shovel operators may address the "Byrons" 1105 Hennen Bldg., New Orleans.

Mr. J. A. Burt, of Dennison, Miss., has just placed his order for a Bucyrus 14-B steam shovel, through the New Orleans office of the Bucyrus Co. Mr. Burt intends using this shovel for loading wagons on a large levee contract he has near Greenville, Miss. This is a move in the right direction and its success will no doubt interest other levee contractors in doing the same things.

Bids were opened on 40 miles of railroad construction for the N. O. N. C. Ry., at Jackson, Tenn., on Feb. 10th. No awards were made for this work but it is expected they will be this week.

Mr. O. O. Ogden, of Baton Rouge, La., was a caller at this office last week and reports bad weather, interfering with his levee work at Avondale, La. Mr. Ogden has installed an oil burner on his Bucyrus class-24 dragline and says it is all right.

It is with much sorrow that we note the sudden taking away of our old friend "Bob" R. L. Leonard, of Memphis. On Jan. 27th, while coming into Memphis from his plantation out on the Rock Island Ry., a collision occurred, killing three people, one of which was Mr. Leonard. Mr. Leonard was a very successful levee contractor and his sudden death has cast a gloom over many of his acquaintances.

The Garyville Northern Ry. have just installed a Bucyrus 60-C shovel, the purchase was made from J. M. McCarthy of Gainesville, Fla., through the N. O. office of the Bucyrus Co. They were very anxious to purchase a new one but could not consider the present delivery. They have about 100,000 yds. of cut and fill on their road.

Mr. Geo. Callamore, formerly of Toledo, O., and Birmingham, Ala., has accepted a position in the office of D. B. Gore Co., Inc., at Baton Rouge, La.

Massachusetts

J. T. Brown is with the Wilson & English Construction Company at Ayer, where they are operating a Bucyrus shovel in the construction of a new railroad yard.

Michigan

William F. Lundquist, who until recently has been in Advance, Missouri, has moved to Kent City, Michigan.

Minnesota

Twin City News

CLAPP, NORSTROM & RILEY,
1308 Pioneer Bldg., St. Paul.

It is really amusing and quite "vaudvillian" to watch the opening of bids for million dollar contracts, equipment and material, but it is disgraceful and an insult to contractors who have spent millions in plant and years of time in mastering construction problems and employing the best talent the world produces, to be invited to bid on work and then be turned down under the plea that the bunch around the City Hall can do the job cheaper by force account and gain some political prestige. If these men of no experience had any idea what it costs the contractors to make intelligent estimates on the work they have advertised for bids on, they would perhaps give the matter more consideration, but they have no means of knowing, neither have they any means of knowing what the job they do by force account costs, as their published cost covers only the amount of labor and material paid for. They do not publish the enormous overhead expense

which had to be paid anyway to political dead timber. If they would employ their talent in cutting out the dead timber of the "nothing else to do" class, and give more consideration to contractors who are equipped with plant and talent, the city would be much more economically served in making improvements.

J. C. Cox has started on his contract for Drainage Ditches for Ramsey County, just outside the city limits and has started in breaking frost and operating a steam shovel. This ditch will cost the County $15,500.00. He has been awarded road work in the same territory to the amount of $12,500.00 and is now constructing camp wagons equipped with Tiger Steel Bunks for sleeping quarters and sanitary and heating arrangements. The dining and office cars are to be electric lighted and built with the comfort of his men in view.

Foley Bros., Grant Smith Co., are doing a pile of driving at the new Armour plant at South St. Paul. Twenty-five thousand piles is some underground forest, being driven by four number one Vulcan steam hammers. Each of these hammers weigh 15000 pounds and strike 90 blows per minute. This inverted sub-surface forest is growing at the rate of 400 trees per day, each being driven thirty feet under ground to support an immense building.

Mr. Ross Wilcoxon, for the past four years in the Denver, Colo., office of the Western Wheeled Scraper Co., has accepted a position with Clapp, Norstrom & Riley at their St. Paul office and has taken the position formerly held by Mr. Arthur Anderson who has gone to the Butte, Mont., office of this firm. Enroute from Denver, Mr. Wilcoxon's train became snow-bound and he was delayed for 48 hours during which time Jack Frost fell in love with one of his ears and marked it for his very own.

Siems-Cary Co., have added to their already enormous contracts in China, 300 miles of completed railroad to run Siangyangfu to Nanyangu in the Province Hupeh. It is intended to have the rolling stock large enough to have the name of the road printed in plain American. The hieroglyphics in Chinese designating the name will be painted on flags and carried by coolies at 6¼c per day of 24 hours, until the eight hour law is passed.

Angus McDougal, general superintendent and all-round construction man who lives at 904 W. 22nd St., Minneapolis, Minn., is at present disengaged. There is no construction work too large or too difficult for Mr. McDougal to manage and the contractor furtunate enough to secure his services will eliminate a bundle of detail and responsibility from his own shoulders.

If the people of St. Paul including L. W. Hill, president of the Carnival Association, had shown as much interest in the comfort of the traveling public as they have in a few Indian dog "mushers" and the dog races, they would now be enjoying a comfortable, if not a grand architectural monument, erected to the memory of the greatest railroad builder and pioneer the world has ever known, for such is the record of James J. Hill. Dog races are all right in their way and prove courage and endurance. But if the people want exhibitions of courage and endurance, let them go down on First Street any of these cold days and watch the travelers waiting in the old ramble shack sheds for trains that never arrive. This sight will make Indian dog races look like pleasure jaunts in spring time with a pack of Mrs. Vernon Castle's pom-pom poodles and wrist monkeys.

The following bids were received by the City of St. Paul, Minn., February 5, 1917, for the construction of the high service reservoir. The cement and steel to be furnished by the city.

W. J. Hoy Co.	$275,319.00
Thornton Bros.	267,874.00
Siems Schaffner & Helmers	266,518.00
W. J. Cowles Co.	254,090.00
Winston Bros. Co.	251,319.00
Geo. J. Grant Construction Co.	246,540.00

It will be noted from the above that Geo. W. Grant Co. was the low bidder. The contract was not awarded them however, as the bid was about $3,000.00 higher than the engineer's estimate and the City has not yet decided whether to award the contract or do the work force account.

Thornton Bros. were low bidders on Como Ave. and Rice St. paving. Their bids on the two streets totaled $130,367.00 which was $6,000.00 below the Engineer's estimate.

Fielding & Shipley bid $144,237.00 or $7,600.00 under the City Engineer's estimate on Prior and Grand Avenues. These bids are held up to consider whether the city will do the work on force account or award the contract to the low bidders. When reliable firms like Thornton Bros. and Fielding & Shipley go to the expense of making bids that are below the estimate of the engineers, there should be a law compelling the City to award them the contracts and we are not sure that there is not such a law now in force.

Missouri

St. Louis Items

BY A. B. KOENIG

The Heman Construction Co., St. Louis, Mo., were awarded the contract for constructing 15 ammunition buildings for the Government at Rock Island, Illinois.

The contract for the engineering work on the oil pipe line which is to be constructed by the Roxana Petroleum Company of Tulsa, Okla., from the fields in Cushing, Okla., to St. Louis, where a $10,000,000 refinery is to be built, has been let to the firm of Sanderson & Porter of New York. E. N. Sanderson, a member of the firm is president of the Springfield Gas Traction and Lighting Co. The line, according to present plans, will pass through Missouri, about twenty miles north of Springfield. Advices from Tulsa are that the construction work will be done by the Yarhola Pipe Line Co., which is a subsidiary of the Roxana Co. The Roxana Company already has begun to absorb a number of smaller Oklahoma and Kansas Oil Companies whose officials are dissatisfied with the manner in which they have been treated by larger operators.

The L. J. Smith Construction Co., Commerce Bldg., Kansas City, Mo., have a lot of bridges on the Shattuck Line in Southwestern Oklahoma to sublet. There will be about 75,000 lineal feet of piling and 700,000 feet B. M. timber in this job. Contractors interested in this write Scott Mitchell, vice-president of this firm, to Kansas City.

The Pullman Company took title to about 50 acres of the 65-acre tract on which options were secured recently. Title was taken sometime ago to other real estate. The deal was directed by the Mississippi Valley Trust Co. The property transferred to the Pullman Company was 39.48 acres, fronting 909 feet, 2½ inches on the north side of Kennerly avenue, and a frontage of 905 feet, 6⅞ inches on the south side of Bircher street, both tracts being near Semple avenue. The Company will soon begin building a new plant on the site. At least 2000 men will be employed in the shops. Homes for the workmen will be built about the plant.

W. J. Frein, of the R. H. & G. A. McWilliams Company, was here last week attending the funeral of his uncle, Robert Watton, who died at the age of 84 years. Frein returned to Quincy where he is superintending the building of a couple of large drag lines that are going to be used in the Indian Grove and Gregory, Mo., districts north of Quincy, Ill.

Ed Hely is going to build an addition to his big crusher plant near Cape Girardeau, Mo.

Capt. A. W. Farney was with us a couple of days last week. The Captain is going to resume work on his revetment and shore protection job on the Missouri River as soon as the weather and river conditions will permit.

Robert Watton, 84 years old, one of the men who built the first fifteen miles of the Missouri Pacific R. R., died at his home here Feb. 1, 1917, of a complication of diseases. Watton came from England and settled in St. Louis in 1852. He was one of the first employes of the Missouri Pacific R. R. and superintended the construction of the line from the Old Seventh Street Station to Kirkwood, Mo. After working for the railroad for nearly thirty-four years, Watton retired and lived with his daughter, Mrs. Mary Frein.

The Frazier-Davis Construction Co., of St. Louis, Mo., are going to put in the foundations for the 15 government ammunition

buildings for the Heman Construction Co., at Rock Island, Illinois.

Contractors, when in want of labor or work for their outfits, write Koenig's Labor Agency, 612 Walnut St., St. Louis, Mo., or 503 Delaware St., Kansas City.

J. E. Lyman, a good all around railroad superintendent, is here idle at present.

The J. W. McMurray Contracting Co. were awarded the contract for repairing the M. K. & T. bridge across the Arkansas River at Osage, Okla. Also for building a bridge at Oklahoma City, Okla. In addition to this the McMurray Contracting Co. are putting in the foundation on the new Highline bridge in Kansas City.

G. L. Tarlton, president of the East Side Levee & Drainage District, returned to East St. Louis on Feb. 12th after an extended visit to California.

T. J. Dolan, the wide awake and hustling Chicago supply man, was in town several days last week on business.

Countering the move of the Alton & Southern R. R., which will build docks at East Carondelet, the Illinois Terminal R. R. obtained a franchise from the Alton City Council to build $250,000 docks in Alton. The Alton & Southern, which is controlled by the Aluminum Ore Co. is an outer belt line around East St. Louis. The ore company has ordered a fleet of barges, which connecting with the belt line, will operate on the Southern Mississippi and the Ohio Rivers. Incidental to these maneuvers, it has been learned from a seemingly authentic source that the Roxana Petroleum Co. will construct its $1,000,000 oil refinery n Wood River, just south of Alton. This Company's pipe line will extend from Tulsa, Okla., to St. Louis, and will come up the Iron Mountain Ry. right of way in St. Louis County to Carondelet, where it will be carried to the Illinois side, and then northward to Wood River. The Roxana Company proposes operating barges on the Mississippi. The Illinois Terminal R. R. forms a belt line from Alton via Wood River to Edwardsville and Formosa Junction. It crosses 13 railroads, while the Alton & Southern crosses the same number. The proposed docks will cost $250,000. The franchise to extend the tracks provides for the crossing of three thoroughfares and one city block.

Kansas City and Vicinity

BY M. T. BABB

Cameron Joyce & Co. were successful bidders on change of line for Santa Fe R. R. in southern Oklahoma—about 75,000 yds. of work. It is understood R. T. Amis will do the work.

Bids were received Feb. 7th for the construction of Van Brunt Blvd., this city. The work involves about 130,000 yds. of material. This is mostly earth—the rock being almost a negative quantity. The following were bids on earth and rock.

	Earth	Loose Rock	Solid Rock
M. Haase	43½	1.00	1.00
H. H. Hannenkratt	45	1.00	1.00
M. Murphy	50	1.00	1.00
W. C. Mullins	46½	.01	.01
J. C. Lyle	53	.20	.20
E. F. Clarkson	69	1.00	1.00
C. G. Brosnahan	47	.10	.10
E. Meegan	48	.75	1.00

M. Haase is low bidder on this work.

Mr. Chas. Dooling is spending the winter with his father and sister at 3229 Charlotte St., this city. Dooling Bros. have completed their U. P. contract and Charlie is taking a well deserved rest. The war situation as it stands today is very appealing to Mr. Dooling. He says a good fight is just exactly to his liking. He votes to uphold our president, and wants the world to know it.

P. J. O'Leary has completed his dragline work for Wood Bancroft & Doty and his outfit is now idle. Anyone desiring a good dragline contractor can get in touch with Mr. O'Leary by addressing him care of the Western Wheeled Scraper Co., Kansas City, Mo.

The Anthony & Northern R. R. has secured substantial capital for the summers operations and an extension of considerable proportion will be built. Press notices are also to the effect that townships along the right of way are voting bonds by substantial majorities.

Mr. Mead, of Mead & Fillmole, Beloit, Kansas, was a Kansas City visitor recently. This gentleman is new in the grading business for the very good reason that he a young man. But it is our idea that he is to become one of those big contractors of the southwest. He is built just that way.

List & Gifford were probably low bidders on a nice piece of property grading in this city. About 75,000 yds. are involved and more yardage may be added to this work, increasing it to twice the above figures. So many figures for the different classes of work were necessary on the above that at this writing the award has not been made.

One of the few remaining landmarks of pioneer days in rail roading is gone. Last Wednesday, Feb. 7th, Michael O'Rourke, was laid to rest. And there are times when it seems as though a life has been so filled with hard toil that a rest must come. Seventy eight years is a long life, and the busy years, extending to the very day of his death, could, if they would, tell many a thrilling tale. Building a railroad today and doing the same work 40 or 50 years ago are entirely different propositions. The unprotected plains, the solitude country, had to be endured and conquered. Mr. O'Rourke was one of the pioneer soldiers to help subdue this country and reclaim the west. He was a soldier not only by comparison, but in fact, through four years of our civil war he fought for the Union. Now these busy years are over. His was an unpretentious life and in the whirl of business he will soon be only a faint memory, but let us remember this: That Michael O'Rourke was a man of upright principals and in many ways a model that could well be heeded.

Montana

Contract for grading and laying 20 miles second track between Shelby and Cut Bank has been awarded to Porter Bros., Spokane, Washington.

Contract has been awarded Grant Smith & Co., Henry Bldg., Seattle, Wash., for constructing 30 miles of railroad for Great Northern Ry., out of Kalispell.

Ohio

Brocklehurst and Potter Co., of 1328 Broadway, New York, are at present engaged in a 1,200,000 cubic yard contract near Delaware, Ohio. This contract is for a cut off on Toledo Division of the Pennsylvania lines west of Pittsburgh. The contract includes 30,000 yards of masonry. H. J. Colliers & Co., of Delaware, Ohio, are the masonry contractors, and have five concrete plants on the job, four steam shovels. A Bucyrus 70C, 70 tons and a Marion model 60, and a Marion model 28, 150 Western four-yard dump cars are used with 2 Porter, 7 Vulcan, and 2 Davenport 10 x 16 locomotives. It is estimated that the job will be finished on July 1, 1917.

Our friend J. H. Bitner is now in Canton, and the old proverb about the rolling stone certainly applies to him. He has now dodged cold weather by earning four bucks a day working inside. He says he has not forgotten how to handle his old monkey wrench and hammer in a machine shop. He will be ready to "hit the big muckers" about the first of April.

Oklahoma

Contract for grading and changing Santa Fe R. R. near Purcell has been awarded to Cameron, Joyce & Co., Midland Bldg., Kansas City, Mo.

Oregon

News from the Northwest

L. T. RUSSELL, PORTLAND, ORE.

The Interstate Bridge between Vancouver, Washington and Portland, Oregon, was opened for traffic on February 14th. This

bridge has been under construction for about two years, and is of great value to local interests.

C. P. McDowell has been visiting in Portland for about a month but has returned to Ruth, Nevada, where he is running a Bucyrus shovel in the copper mine.

Porter Bros., Portland, Oregon, have 24 miles of railroad work in Montana between Shelby and Cut Bank. The greater part of this is team work, but there is one rock cut, also one heavy earth cut on which shovels may be used.

Robert Crowell, who is operating a Bucyrus 85-C shovel for the O-W. R. & N. Company, was a caller at our Portland office recently.

Gene Pruner has returned to Portland after four months' absence. He has been running a Bucyrus 45 for the Idaho Gold & Radium Company near Lenia, Idaho.

A. J. Rees called on us lately, he was on his way to California to take one shift on a Lidgerwood dragline owned and operated by S. R. Fox.

Grant Smith & Company recently secured a good-sized piece of work from the Great Northern in Montana, and we understand Mr. Swan Benson will be in charge of construction work.

Business conditions in the Northwest continue to improve in a general way though slowly, the prices for contractors are still below what they should be, especially with labor so scarce and high as at present. Several railroad jobs are in sight, also a good deal of highway work, and we may expect an increase in prices for all classes of contract work before the 1917 season has far advanced.

Panama

The following dredges have been formally retired from service on the Panama Canal: The 5-yard dipper dredges *Mindi, Chagres* and *Cardenas*, and ladder dredges *No. 1* and *No. 5*. The improved condition of the channel has made it possible to retire these dredges.

Pennsylvania

A. Wagoner is operating a 70C Bucyrus shovel for J. H. Corbett at Freeport, Pa.

P. McMannus, Philadelphia, Pa., has been awarded a contract by the Pennsylvania R. R. Co. for building about 8 or 9 miles of road between Delmont and Saltsburg, on which work will be started at once.

The Keystone State Construction Co. was low bidder for construction of the Philadelphia subway delivery loop at a total of $5,784,000. Contracts will not be awarded until Public Service Commission passed upon the city's application for authority to construct the lines.

Contract for constructing a branch line to Coatesville, about 7 miles, and to include sidings to accommodate 600 cars or more, has been let by the Pennsylvania R. R. Co. to Walter P. Cliffe Co., Philadelphia, Pa.

Rhode Island

Contract has been awarded Wilson & English Construction Co., Inc., 50 Church Street, New York, N. Y., for grading roadbed to connect the New York, New Haven & Hartford R. R. tracks at Eddy Street with the municipal docks.

Tennessee

W. I. Hudson is now with Ball & Peters at Memphis. Our readers may remember that he was cranesman on the Bucyrus shovel No. 226 that took the last dipperful of earth out of Culebra Cut on September 10th, 1913, at 10:54 a. m. A. L. Gedes was engineer. Mr. Hudson's present address is Box 761, Memphis.

Sparks from Ball & Peters Camps, Memphis

BY W. I. HUDSON

The 70-ton Bucyrus is running double-shift loading 15-yard standard-gauge cars. This Bucyrus has been in this borrow pit since last Labor Day, and has taken out many yards of material for the C. R. I. & P. R. R. for the big bridge project. If the high water does not run us out, we ought to get done by the 15th of April.

Shovel men on this job are all lovers of the good old Bucyrus, (especially W. I. H.).

The day crew is J. E. Hurley at the throttle and W. I. Hudson "boom-cat"; A. L. Prewett is at the throttle at night and Joe Johnston is craning for him.

The crew on the Marion-60 in North Memphis are Cliff Daniels, engineer, and W. T. Thornton, cranesman.

We have heard a persistent rumor that our friend W. I. Hudson made a flying trip to Nashville. The boys on the job cannot learn just what his girl did to hypnotize him, for he certainly does not seem like the same old "boom-cat".

Texas

E. M. Donley is operating a steam shovel for the G. C. & S. F. Ry. at Texas.

C. H. Crowell who has for the last six months been operating a large dragline for the United States Government is now at Bellaire. His address is P. O. Box 76.

M. D. Strickling is operating a Bucyrus shovel for the G. C. & Santa Fe Railroad at Scallorn, Texas. M. D. Strickling is pit foreman, J. D. Ford night watchman. The three are old employees of the G. C. & Santa Fe R. R.

E. M. Danley is operating, W. L. Hutcherson is craning, Frank Fitt firing a Bucyrus shovel for the Santa Fe at Alvin, Texas.

W. S. Hutcherson is craning and Frank Fitt firing a 95-ton Bucyrus shovel with a 5-yard dipper for the Gulf, Colorado & Santa Fe Railroad at Alvin. Both boys say that the shovel is making a very good record although it is getting on in years it's a "good old mill yet." Mr. Hutcherson's home address is Oakdale, Louisiana.

Virginia

W. J. "Rube" and Frank Broderick are operating class-20 and class-14 Bucyrus dragline excavators at Portsmouth. In fact it is a Broderick job as there are two more Broderick's firing for their brothers. The work is in the Portsmouth Navy Yard where they are excavating for a new dry-dock. Dragline men may be interested that not long ago the Universal and Pathes both took moving pictures of the class-14 breaking ground, so keep your eyes open for this.

Wyoming

Platte River Project Notes

Winston Camp.

Mr. W. O. Winston, Jr., is enjoying an extensive trip through the South. Mr. William Rohen of Minneapolis is in charge during his absence.

The Old Mengel Cabin at Camp No. 1

Mr. Nichols of Minneapolis is operating the new auto truck recently purchased by the Winston Construction Co.

The Winston Co. has opened up a new dragline camp 6 miles southwest of Torrington, Wyo., where they are erecting the class-24 Bucyrus. F. A. Mengel is doing the erecting.

Ray Adams, engineer, has moved his family from the old Fort Laramie Camp to the Lingle Camp.

Mr. F. A. Mengel has moved his family to the Torrington camp.

Mr. and Mrs. F. A. Mengel gave a house party in their cabin before moving. Dancing was the amusement. Lunch was served at 12 midnight. Music was furnished by the U. S. R. S. orchestra.

Mrs. Frank Lenberg and her child of the Winston camp has been seriously ill. Both are improved at this writing.

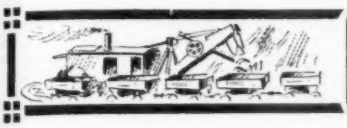
Winston Co. are busy with their auto truck hauling coal for the different camps.

Mr. and Mrs. L. W. Allison of McArthur Bros. camp are enjoying an automobile trip through Iowa.

Mrs. Frank Rowl of McArthur Bros. camp recently underwent an operation at Wheatland, Wyo. All her friends are glad to note that she is somewhat improved and able to be in camp again.

Hilton Camp.

The Hilton Construction Co. are still in hard rock, and a great deal of blasting is required in order to handle the material. The class-20 Bucyrus is doing her share of digging in spite of the hard work.



PROSPECTIVE CONSTRUCTION

Alabama

The Mobile, Volanta & Pensacola R. R. Co. is contemplating twenty miles of road from Gabel to Elberta via Holland, Barclay, Clay City, Orange Grove, Summerdale, Elberta, involving 50,000 cubic yards of earth excavation, 51,000 cubic yards of embankment, one short trestle. M. H. Miller is engineer in charge, Sea Cliff P. O., Volanta, Ala.

It has been decided by the board of revenue Clayton, Barbour Co., to construct a national highway between Eufaula and Bullock Co. line, about 48 miles.

Arkansas

Pine Bluff & Northern Ry. Co. (J. K. Riffel, receiver, Southeastern Trust Bldg., Little Rock, Ark.) plans extending its present road from McCreanor to Pine Bluff, a distance of about 35 miles.

California

Bids will be received until 10 a. m. March 26, by the board of public works, Los Angeles, for construction of the Second Street tunnel, 1502½ feet in length, 50-foot radius in clear, involving approximately 99,700 cubic yards excavation, 1502½ linear feet timbering and centering for arch, 109,670 cubic yards of earth to be hauled (including 10 per cent increase over excavation in bank), 17,003 cubic yards concrete, 2710.2 M brick in arch, 125,620 square feet white enameled tile, 1500 linear feet gravel back filling, 126,000 square feet plaster intrados (material for two and labor for one coat, the labor on second coat being included in tile work), 361,850 pounds steel reinforcement, 9750 square feet sidewalk, 1502 feet curb, 62,200 square feet bitulithic paving, 600 cubic feet ornamental stone work. Plans and specifications may be obtained from the city engineer's office on deposit of $3, which will be refunded on return of plans. Estimated construction cost (tentative estimate about a year ago) $744,000.

Water Co. No. 3, El Centro (Sidney McHarg, president) has proposed to the Imperial Irrigation District that a dam costing approximately $60,000 be built at a point two miles south of Rockwood, near the bridge crossing, to raise the water level and secure a flow through the Alamo channel to supply the lands under the No. 3 system in the northeastern part of the valley. No. 3 Co. proposes that the district pay $25,000 of the cost, and save the cost of a wasteway, the sum to be credited the water company in water rentals. C. K. Clarke, chief engineer for the Imperial Irrigation District, has been directed to report on the project.

It is intended by Frank A. Vanderlip, 55 Wall Street, New York, N. Y., to construct 100 miles boulevard on his Palos Verdes ranch, San Pedro.

The board of supervisors, San Bernardino, has called an election for March 27 to vote on the proposition of forming an irrigation district, to be known as the Mohave River Irrigation District, embracing about 28,000 acres on the east side of the Mohave River in Victor Valley and Apple Valley, in the vicinity of Hesperia. It is the intention to construct a dam at the west fork of the Mohave River to impound about 76,000 acre-feet of water. F. E. Trask, Union Oil Building, Los Angeles, is consulting engineer on the work.

Idaho

The Boise, Twin Falls & Nevada R. R. Co. has incorporated with a capitalization of $3,000,000 for the construction of a line from Boise to the end of Breneau Valley, 90 miles. W. E. Pierce and J. H. Richards are incorporators.

Illinois

A. Quinlan, county superintendent of highways, 325 Court House, Chicago, will furnish further information regarding construction of 60 miles hard surfaced roads to cost about $1,000,000.

Kentucky

It is being planned by county commissioners, Albany, to construct a 13-mile road from Albany to Wayne County line.

Bids for reconstructing about 50 miles of pikes will be received until April 3 by Fiscal Court of Bracken Co., Brooksville.

Contracts for reconstructing 100 miles of roads will be let in April by G. Singleton, clerk, Paducah. Will also include several large bridges, total cost $250,000.

Louisville & Nashville R. R. (H. C. Williams, ch. engr., Louisville) will construct a 10-mile branch coal road up Clover Fork, surveys are now being made. The company will also double track the entire Cumberland Valley from Harlan to Corbin, according to a report.

Mississippi

It is reported that the New Orleans & Northeastern Ry. (W. H. Wells, ch. engr., Washington, D. C.) will double track its line from Meridian to New Orleans.

Bids for the construction of 22 miles of ditches requiring 1,053,000 cubic yards of excavation will be received at Senatobia, Mississippi, March 7, 1917, by the Arkabutla Creek Drainage District. The work is divided into two contracts and will require two machines. The construction can best be done with floating dipper dredges.

Plans and specifications can be secured from the Morgan Engineering Company, Memphis, Tennessee, who are engineers for the district.

Montana

Porter Brothers, Spokane, have been awarded contracts for grading and laying 25 miles of second track for Great Northern between Shelby and Cut Bank, Montana.

B. O. Johnson, superintendent Montana Division, Northern Pacific Ry. Co., reports that his company will expend $2,000,000 on the 33-mile alternate low grade line between Logan and Bozeman. Construction will be started about April 1.

Oklahoma

It is being planned by the St. Louis, Iron Mountain & Southern R. R., E. A. Hadley, chief engineer, St. Louis, Mo., to construct a branch from Claremore to Tulsa, distance about 25 miles.

Oregon

It is being contemplated by Prineville & Northern Ry. Co., H. A. Kelley, chief engineer, Prineville, Ore., to build a new line from Prineville to a point near Redmond, distance about 19 miles.

The O. W. R. & N. R. R. in budget for 1917 provides for first division between Umatilla and Portland, $142,000; second division between Huntington and Umatilla, $728,000; from Riparia, on Yakima branch, $83,000; fill near Spokane, $72,000; Riparia to Spokane, $262,000.

The Portland & West Coast Ry. & Navigation Co. proposes to construct line between Portland and Newport, 112¼ miles, on which work will be started this year.

Pennsylvania

Surveys are being made by the Pennsylvania R. R., A. C. Shand, chief engineer, Broad Street Station, Philadelphia, Pa., for constructing a line from Besco through Clarksville and Hackney to Waynesburg. Cost about $3,000,000.

South Carolina

It is being planned by the Atlantic Coast Line, J. W. Willoughby, ch. engr., Wilmington, N. Car., to double track its main line from Florence to Lane, distance about 48 miles.

The Atlantic Coast Line R. R. Co. is planning to double track its main line from here to Lane, about 48 miles. J. E. Willoughby, chief engineer, Wilmington, N. C.

Tennessee

It is being planned by the Southern Ry., B. Herman, chief engineer, 1300 Pennsylvania Ave., Washington, D. C., to extend line from Greenville, Tenn., toward Ashville, N. C., distance about 8 miles.

It is being planned by the Gulf Mobile & Northern Ry., W. F. Owen, president, Memphis, Tenn., to extend line from Middleton to Jackson, distance about 40 miles.

West Virginia

The Kanawha & Michigan Ry. is contemplating construction in the early spring of extensions from Gauley Bridge to Peters Creek, about 20 miles, at an estimated cost of $1,000,000. C. M. McVay, Engineer, Maintenance of Way, Charleston, W. Va.

Contracts are expected to be let soon for piercing a 300-foot tunnel, also a 350-foot tunnel on the line of the Wheeling Coal Railroad. One of the tunnels will be about 5 miles east of Elm Grove, Pa., and the other about 8 miles east of the same place. The plans of the Wheeling Coal Railroad call for a line from a point on the Pennsylvania-West Virginia state line near Majorsville to a connection with the Wheeling Terminal Railway at Wheeling, W. Va., and in Pennsylvania from Majorsville east to Mariannia, where connection is to be made with the Millsboro branch of the Pennsylvania Railroad.

Bids for constructing two concrete roads, 9 feet wide and 2 and 6 miles long respectively, will be received by Winston & Co., First National Bank Bldg., Pennsboro, until March 29th. Separate bids will be received for grading and paving or for both.

Bids for constructing approximately 28 miles bituminous macadam or concrete roads will be asked in March by T. F. Maloy, engineer, Landisburg. This will involve about 112,000 cubic yards excavation and cost about $325,000.

Wyoming

The U. S. Reclamation Service is now calling for bids on the largest earth moving job it has advertised so far this year. The work calls for 2,227,000 cubic yards of excavation from the Fort Laramie Canal of the North Platte Project. It is located near Fort Laramie, Torrington and Lingle, Wyo., on the C., B. & Q. Ry. The bids are to be opened March 15th.

TRADE NOTES

The Troy Wagon Works Co. has secured an order from the United States Circus Corporation for forty-six No. 212 Troy Trailers.

Mr. Frank P. Spellman, who is president of the United States Circus Corporation, is one of the best known circus men in the country. Mr. Roy K. Knabenshue is the engineer of the company, and spent a solid year in investigating and studying various motor trucks and Trailers before arriving at a decision.

The show is one of the largest on the road, and will be completely motorized, having standardized on Troy Trailers and Kelly Trucks.

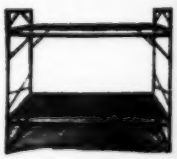
New England, the East and Middle West will be covered in the summer schedule, which starts early in May.

The United States Circus Corporation has accurate and detailed information about every foot of road over which they are routed.

The Troy Trailers will be used for hauling employees, carrying equipment and such animals as do not have to be caged. For the latter, special trucks will be furnished.

Each truck is to be equipped with a power winch to take care of any extraordinary conditions.

Give Your Men Clean, Comfortable Beds
to sleep in and they will do better work.

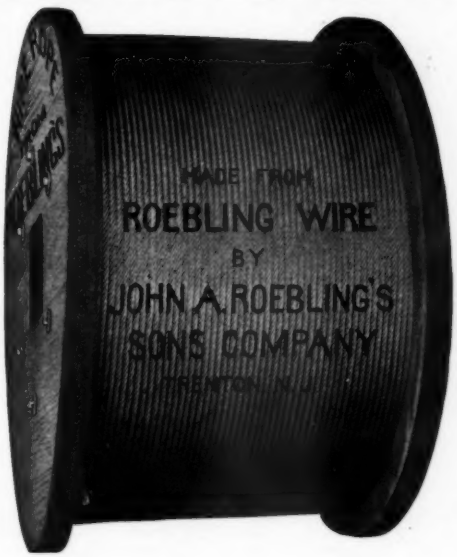


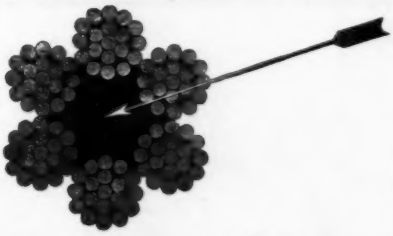
"TIGER" STEEL BUNKS are of durable and sanitary construction. Frames are steel, coated with rust-proof enamel. The wire link fabric springs are attached to the frame with oil tempered helical springs which assure elasticity and are guaranteed against sagging. Easily knocked down for shipping. Require very little space. Made in single or double decks in a wide range of sizes.

Write for particulars and prices

HAGGARD & MARCUSSON CO.
1113 W. 37th Street CHICAGO

ROEBLING DREDGE ROPE





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LOOK FOR THE BLUE HEMP CENTER

WIRE ROPE FITTINGS

John A. Roebling's Sons Company
165 W. Lake St., CHICAGO, ILL. TRENTON, N. J.

Send for catalogue and prices

"OLD RELIABLE" "XX" SHOVEL CHAIN

Some manufacturers make several grades of so-called Shovel Chain. We make one grade, the

"OLD RELIABLE" "XX" HIGH-GRADE CHAIN

THE ONLY CHAIN THAT REQUIRES NO GUARANTEE

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SECOND HAND STEAM SHOVELS, LOCOMOTIVE CRANES, LOCOMOTIVES, CARS, WAGONS, RAILS, ETC.

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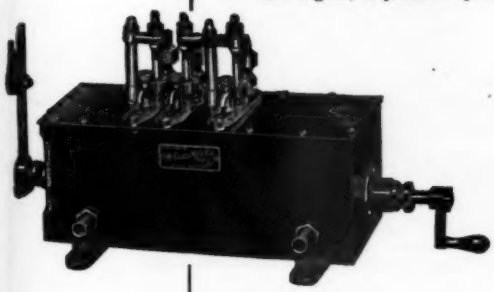

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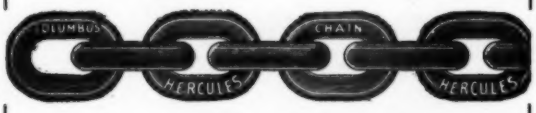

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THIS 1,500,000 cubic yard ditch job on the Sun River Irrigation Project, Montana, was cleaned up in two seasons with two Westinghouse-driven Bucyrus dragline scrapers. Some interesting cost figures are available. Electric drive was determined upon on account of the high cost of coal.

The larger machine is a Bucyrus class 24 with 100-ft. boom and 3½-yard bucket. The other is a class 20 Bucyrus with 85-ft. boom and a 2½-yard bucket.

Machines were hauled to the job knocked down and were erected in the field.

Costs Here's what each machine accomplished in cost-cutting in the three classifications of material handled:

TABLE 1—Excavation Costs in Cents Per Yard with Class 24 Electric Dragline Valued at $36,326.63.

Item	*Class 1, 333,689 cu. yd.*	*Class 2, 23,319 cu. yd.*	*Class 3, 19,045 cu. yd.*
Interest on investment	0.81c	1.21c	2.25c
Preparatory expense	1.33	1.99	3.73
Plant depreciation	3.63	5.41	10.12
Executive	0.89	1.24	3.09
Labor	5.98	7.85	21.03
Electric power	0.73	1.03	1.82
Supplies	1.13	1.67	6.72
Miscellaneous	0.16	0.15	0.29
Total	14.66c	20.55c	49.05c

TABLE 2—Excavation Costs in Cents Per Yard with Class 20 Electric Dragline Valued at $20,957.13.

Item	*Class 1, 410,747 cu. yd.*	*Class 2, 4,180 cu. yd.*	*Class 3, 9,546 cu. yd.*
Interest on investment	0.44c	0.76c	1.61c
Preparatory expense	1.12	1.20	2.52
Plant depreciation	1.86	3.22	6.79
Executive	0.71	1.31	3.14
Labor	3.70	8.22	15.77
Electric Power	0.78	1.78	2.80
Supplies	1.29	1.53	7.50
Total	9.90c	18.02c	40.13c

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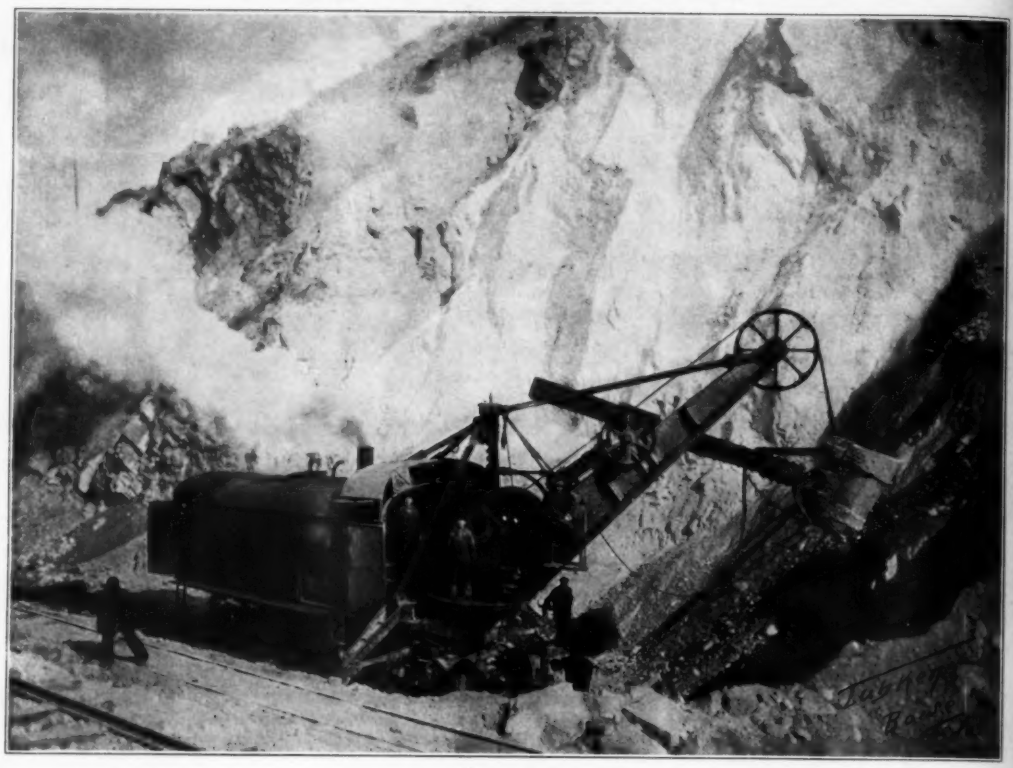

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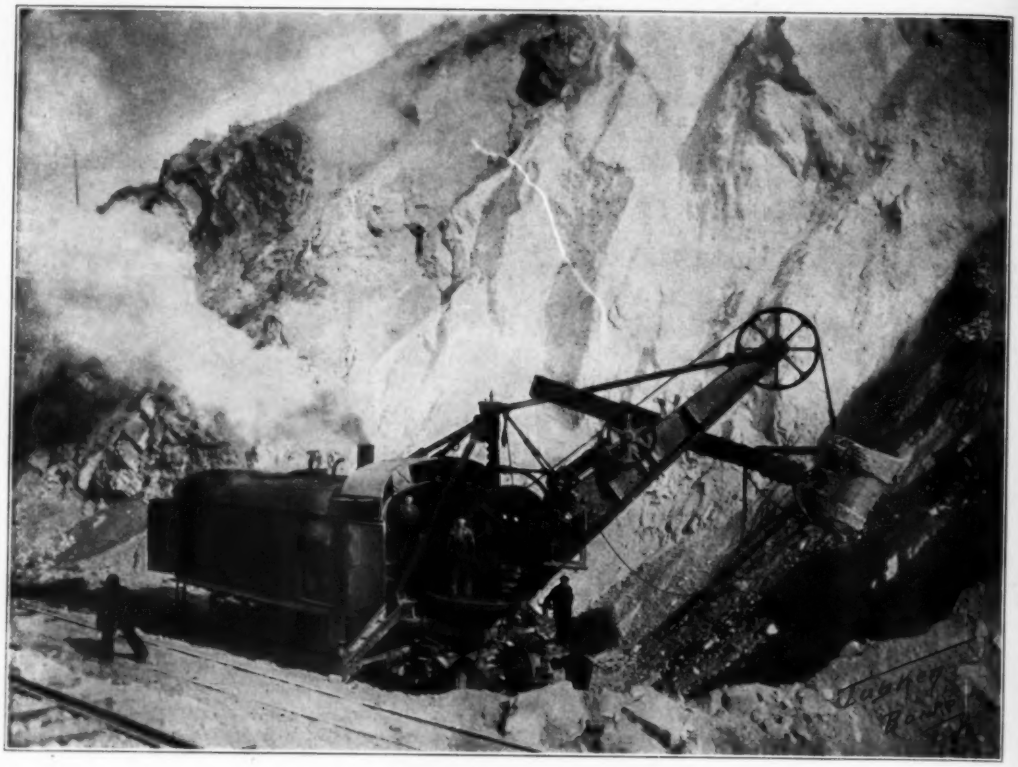

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